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ATHENÆUM OF PHILADELPHIA.

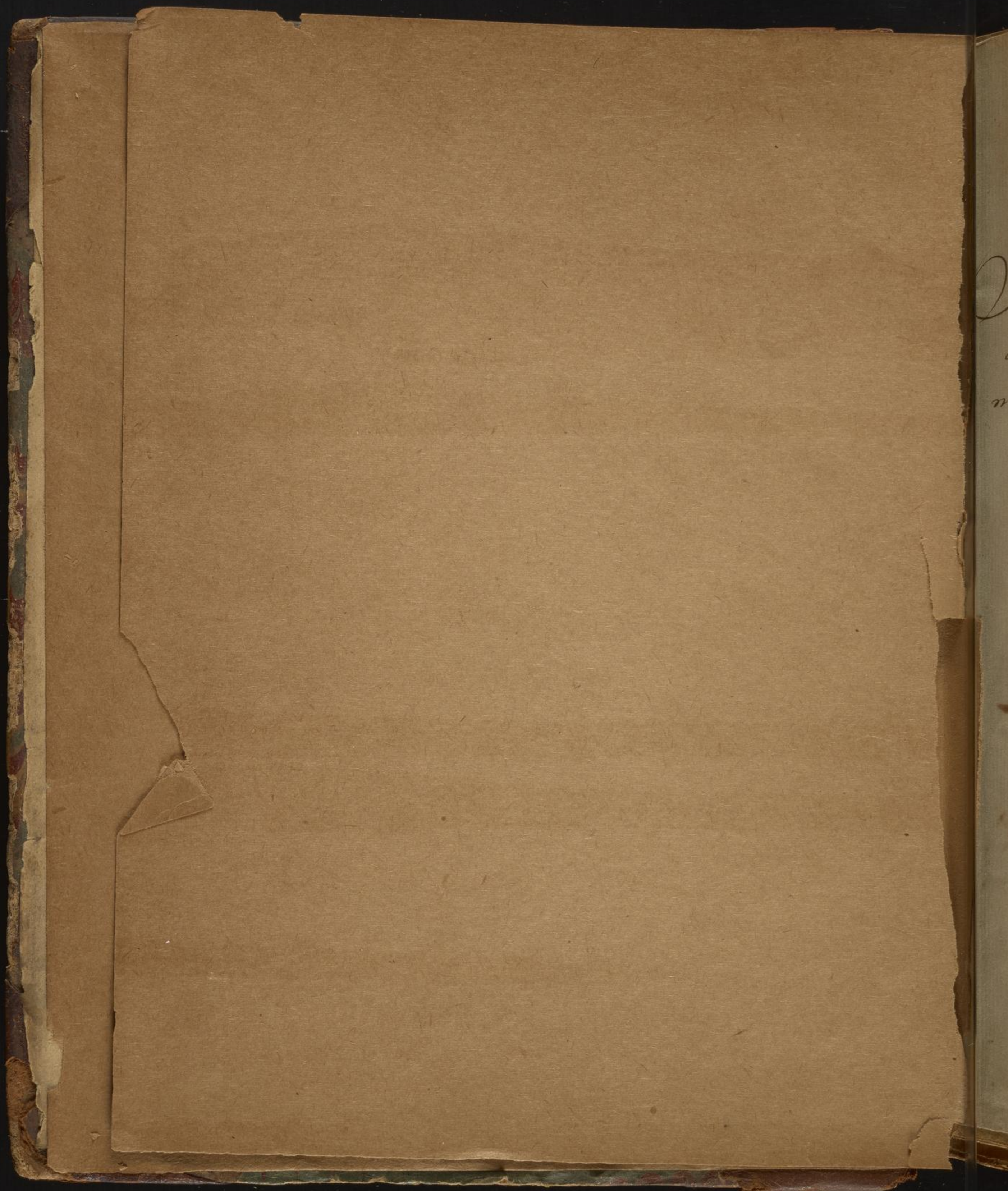
PRESENTED BY *James Cox*





ms. coll 225  
Item 13







*Jacobus Graham in medicina studio se addixit  
 duodecima die mensis Aprilis, Anno redemptionis  
 nostrae Milleesimo septingentesimo octogesimo Octo. —*

*In lib.*







November 3<sup>d</sup> 1788.

1. 2. 3.

# Philadelphia.

Notes taken from a Course of  
Lectures on Chemistry by  
Benjamin Rush M. D.  
Professor of Chemistry in the  
University of Pennsylvania.

## Introductory Lecture.

Gentlemen,

I once more have the honour of addressing  
you personally to a course of Lectures on Chemistry & the  
History and Practice of Medicine. In this Lecture I shall endeavour  
to shew the objects, importance & usefulness of Chemistry.  
The professors of every Science thought, that the more ancient  
the origin of that science could be placed the more dignity it



14. it is supposed. Chemistry therefore held its origin placed in  
times of the most early Antiquity: Thus Noah whom  
we read of in Scripture, was versed in the Art of making  
wine, & Tubal Cain who was a worker in Brass were  
said to be expert Chemists. In my opinion Chemistry  
instead of being the most ancient, is the most modern  
of the Sciences. The persons who say otherwise do not  
distinguish between the practice of an Art and the principles  
of a Science. But being a modern Science in nowise  
detracts from its dignity; for as Lord Bacon observes  
those sciences which are of most use to mankind have  
required the longest time for their formation: Thus  
Astronomy, Navigation, & Electricity were not reduced  
to fixed principles till modern times.

The Earth and ~~whatever~~ compound substance  
which lies hid in its bowels, or is exposed on its  
surface; the waters and whatever are contained in them  
the air and all matters dispersed thro it, are the objects  
of Chemistry. From hence appears what an extensive  
Science it is. Now it will be proper to mark the  
difference between Natural Philosophy & Chemistry  
The first treats of the general properties of Bodies



as specific Gravity, Solidity, Elasticity & whilst<sup>5</sup>  
the latter only treats of their particular Qualities. Thus  
with regard to Air: The Natural Philosopher explains  
its Transparency, elasticity, weight, Bulk & whilst  
the Chemist endeavours to determine whether it is a  
compound or simple body; if a compound, what are  
its constituent parts, in what manner these parts are  
united. Lastly the Effects of heat and mixture upon it.

A Knowledge of Chemistry is of the greatest use to  
the Physiologist; it is absolutely necessary he should  
be acquainted with it, for without it, he can get  
little insight into the nature of the animal fluids.  
By an acquaintance with it he is enabled to discover,  
that the important process of digestion in the Stomach is  
scarcely at least carried on by a Chemical process: some  
light is also thrown on secretion by the same means.  
It must be remembered however, that the Laws, which  
apply to the action of dead matter upon dead matter,  
cannot be applied, but with considerable restriction,  
to the action of inanimate on animate bodies.  
This was not attended to when Chemistry was made  
use of to explain the Functions of the animal machine.

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6. Hence it was frequently applied in a very unbo-  
red and injudicious manner, to account for the Ph-  
enomena in the animal system; which are produced  
by causes totally inexplicable on Chemical prin-  
ciples. But a more intimate knowledge of the Science  
removed the false application of it - The mechanical  
Philosophy, when first introduced to account for these  
Phenomena, was used in the same unlimited injudicious  
manner; but for the same cause it is at present applied  
with considerable restriction, and consequently with  
more propriety. We are still unacquainted with <sup>the causes of</sup> many  
of them. If we could render this cause apparent it w<sup>d</sup>  
throw light on many appearances which occur in the  
animal economy which are now entirely concealed from  
us. Chemistry, as will hereafter be made to appear,  
tends most evidently to the discovery of the cause of  
this Phenomenon. This Science is also applied  
with the greatest advantage to Pathology: - Thus by  
a knowledge of it, we may be led to the proper  
method of investigating the causes of diseases, and the  
manner in which the potentia recentes as they are  
called produce their Effects in the human body



Have we not reason to conclude that the contagious  
miasmata exert their malignant influence by exciting  
a species of Fermentation in the Blood? —

An intimate knowledge of Chemistry is absolutely  
necessary for the Physician, for if ignorant of it, he will  
be liable to prescribe different Medicines at the same  
time which might decompose each other, or disorder  
the Composition in it; or, by their action on each other  
they might produce new compounds possessing qualities  
entirely different from those the practitioner expects;  
perhaps by the new arrangement of parts which takes  
place they may generate substances of very noxious  
Qualities. — We have reason to believe that the mineral  
Kingdom contains an Antidote to every disease with  
which the human Body is liable to be afflicted. — Thus  
we find Tartar emetic to be a certain cure in most  
Cases of Scurvy when exhibited in certain stages of  
that disorder and in proper doses, at the necessary  
intervals of time. The venereal Disease "that just  
scourge of unlearned embraces" baffled the attempts of  
the most eminent Physicians to cure it until  
mercury was discovered to be its certain antidote.



8. It is by Chemistry we are taught to prepare these and other  
mineral Substances so as to be fitted to enter the human Body.  
It is by the assistance of this Science we are enabled to obtain salutary  
medicines from Substances the most pernicious. Some persons have  
imagined that the vegetable Kingdom contained medicines fully  
capable of removing all diseases, and therefore that there is no  
necessity for having recourse to the mineral Kingdom. But I  
would beg leave to ask these Gentlemen did not the serene Almighty  
himself, who first planted the Poppy, and endued the Peruvian Bark  
with its wonderful Qualities, infuse a medicinal virtue into the  
Substances which are buried in the bowels of the Earth. I do not  
mean to infer that Galenic medicines possess no healing prop-  
ties: on the contrary I think they are endued with very valuable  
virtues; but Chemistry is still applicable here, as scarcely any  
vegetable can be prepared for use without its aid. —

This Science also explains the Doctrine of Heat and cold; how  
it is so much useful to the Physician, as by its means he can ascer-  
tain the Qualities of the Climate in which he lives. The Knowledge  
of these Qualities is absolutely necessary to the Physician who  
is engaged in practice, as many Diseases take their Origin  
from a sudden Change in these Qualities. All diseases are  
much affected according to the State of the Climate in which  
they happen. By a Knowledge of Chemistry, Physicians  
are sometimes enabled to discover the Causes of Diseases  
which otherwise would have remained concealed from them.  
Thus Dr. Mead by being versed in this Science, has pretty  
fully ascertained the Cause of the Devonshire Cholera. —



~~This liquor is justly & justly repairs the Leyden, which~~  
~~is impregnated with Lead in that country.~~ This Liquor  
becomes thus impregnated by running from the Press thro'  
Leadn pipes & during its acidity passage by its acidity depositing  
part of this metal. Some Years ago the people of Amsterdam  
~~some years ago~~ were much afflicted for several succeed-  
ing Autumns with a species of Colic much resembling  
that of Devonshire. It was discovered by a Physician  
that this disease was occasioned by the use of water  
impregnated with Lead. His conjecture that the water  
rec'd. this impregnation from the Leaves of the Trees, which  
grew before almost every house, during the Autumn  
falling on the Roofs of the houses, all which were at that  
time covered with Lead. These leaves lying there would ferment  
& thus form a Umegar which would corrode the lead, & bridle  
went down by the succeeding rains, which water was  
used in diet by the Inhabitants. His conjecture has  
been fully verified; for since that time the Leadn roofs  
have been removed & Tiles made use of. The Colic now is  
very seldom heard of.

Chemistry is of the greatest Service to the Metallurgist  
I would here extend the meaning of metallurgy farther than  
is commonly done. I would comprehend under every Operation  
which is performed on any metals by any artist whatever  
the Alchemists have torn open the bowels of the Earth  
to discover a substance capable of converting the base



8. Metals into Gold. They failed, however, in all their attempts. No  
man would have attempted it at all, if they had considered that  
Gold is valuable only on account of its scarcity. Therefore if they  
succeeded in producing this change, they would have defeated the  
purpose for which they underwent such great labour; i.e. their em-  
ployment would have been very little indeed. They however, were  
improved metalurgy — If the limits of this Lecture would  
permit, I might here descend upon the usefulness of Chemistry  
to the Brewer, the Baker, the Dyer, the Soap Maker, the  
Bleacher, &c. Carver, the Painter &c. worker in Clay  
&c. the maker of paste to the fabricator of the most common  
earthen ware — It is also unviable to the natural Philosopher  
From knowledge of our illustrious countryman Dr. Hume  
has been able to discover that Thunder Lightning &c. are  
owing to the presence of nitrous acid in the air, but are entirely  
caused by the action of electricity. From what has been  
said it is apparent that a knowledge of Chemistry should  
not be confined to the Physicians, but that it is unviable  
to many artists, and that it merits the attention of every person  
who wishes to complete a liberal Education —  
I cannot refrain from congratulating you when I find  
that we are placed in a country where there is such a va-  
riety for the exercise of Genius it abounds so plentifully in  
substances which are the objects of Chemistry. Thus precious  
stones of almost all kinds are found on the Banks of the Ohio. Clay  
suitable to the making of Porcelain &c. or on an emerald in the Del. State  
Lead & Copper in Pennsylvania Iron, Cobalt, Cinnabar &c. &c. &c. &c.  
mercury in New Jersey — When we consider this, is it a presumption  
to expect to have our names enrolled with those of a Cullen or a Black



Part 1.<sup>st</sup>

11

In our introductory Lecture we pointed out the uses of Chemistry. At present we shall proceed to say something of its Origin. This Science was rocked in its cradle in Egypt and from thence traveled into Greece & Rome. Moëtus we find mixed Gold with Water, & from hence we conclude he had some Knowledge of Chemistry. In Greece Chemistry made some progress; but as it was entirely confined to Books it made less advancement than it otherwise would have done. In Rome it first made its appearance as a regular Science at this time the Alchemists made their appearance, who aimed at turning the base Metals into Gold; which coming to the Knowledge of the Emperor Dioclesian, he published an Edict which put a stop to their attempts, fearing, if they succeeded by acquiring wealth, they might be enabled to rebel against them. About the 10.<sup>th</sup> Century Chemistry revived in Arabia & Avicenna wrote at this time upon Alchemy. From Arabia Chemistry with the other Sciences traveled westwards & first fixed its seat in Spain it made its next appearance in Germany.

This Country is peculiarly adapted for its improvement as it abounds with Mines. Boerhaave gives a long list of persons who cultivated the science in this Country. but Paracelsus appears to be the first worthy of our notice.



8. 12. He seems to be a very singular and extraordinary Character and distinguished above all Chemists. Before him, Galen reigned the Tyrant in the Schools of Physic. Paracelsus first disputed and called in Question his Doctrines. His opinions tho at first thought bold, finally overthrew those of Galen. Soon after the Death of Paracelsus chemistry made its appearance in England, & was particularly cherished by Lord Verulam, who was the first who wrote upon that Science in that Country. His works are ingenious and deservedly valued. Soon after him appeared the celebrated Mr Boyle who did more Service to Chemistry, than all the Authors that lived before him. As he was born in easy Circumstances it was in his power to improve the Science very much by employing a great Number of Artists in his Labors. He was a Man of great Sagacity & acuteness, and his writings are in a plain easy stile. He concealed nothing but those things which he recd. under promise of Secrecy, or which he thought would be detrimental to the Community if divulged. In some cases he was rather too credulous, in capable of receiving others. He imagined no one would deceive him. He exposed the ancient Philosophy of those days. He reasoned entirely from Facts and declared that he learned more, from frequenting the Shops of Artificers, than from all the Books he ever read.

The works of Bacon & Boyle spread a desire of this Knowledge all over Europe. About this Time the Royal Society was first formed at London. Their Example was followed by others of Europe.



13

Genious in other countries. In Germany Stahl, Hoffmann  
Kunckel & Margraaf known as Chemists. In France  
Geoffroy, Lemery. Macquer Rouelle &c. In England Chemistry  
made but little progress. It has lately revived thru  
M<sup>r</sup>. Lewis spread a Taste for it among some people of the  
first rank. His Philosophical commerce of Arts shows  
how much the arts may be improved by Chemistry  
Dr. Priestley & Don<sup>t</sup>. M<sup>r</sup>. Lavoisier have collected facts. To Dr.  
Cullen & Black of Edinburgh we are particularly indebted  
for this Facts being arranged. Dr. Black deserves to be  
considered as the Father of Chemistry, and first taught it as  
a regular Science, we shall thro this course consider it in  
this light. M<sup>r</sup>. Boyle considered it as a Branch of Natural  
Philosophy. most late writers consider it as an art. The  
Compounders of medicines have been called Chemists, but  
improperly, as they are no more Chemists than the Brewer  
or the Baker, he is only an artist who puts in practice  
what Men of Science have discovered. Great care  
should be taken to distinguish Chemistry from the other  
Sciences. hence we should be cautious in admitting a  
definition of it. Dr. Stahl's definition is too long Besides  
he considers it as an art. Macquer abounds with terms  
as difficult to be understood as the Term Chemistry itself.  
Dr. Black has fixed upon a definition which is devoid of  
these Faults. Chemistry is that Science that teaches the  
Effects



8. 11. Effects of heat & mixture, to improve our Knowledge in  
Nature and Arts, "The more we attend to this definition  
The more we shall be pleased with it. Heat & mixture  
produce all the changes which natural Bodies undergo.  
Heat enlivens all nature and it will afford us much  
instruction to contemplate its Effects. We will just men-  
tion its use in the Operations upon vegetables. By its assistance  
we determine infusions, decoctions, resins. from burning them  
we determine from their ashes a Salt which combined with  
oil forms soap; & this same salt when fused with vitres  
Earth gives us glass. By mixture the Metallurgist  
enabled to fuse his ores. By the mixture of Pottery & the  
we form Porcelain. all our beautiful Varnishes are formed  
by the mixture of resin and the Spirit of wine. All the  
different Prints and Colours are formed by mixture.  
Ether is produced by adding an Acid to Spirit of wine.  
There is scarcely a chemical Operation, in which mixture  
not a useful and necessary Agent, some object to our Defining  
that Chemistry is not a Science, & that it tends only to  
improve our Knowledge in Nature and not in the Arts;  
for say they, the improvements in the Arts have been made  
by the Artists themselves, who were ignorant of Chemistry.  
We grant and the love of money may have led some igno-  
rant Men to make discoveries, but the greatest were made  
by men eminent in Chemistry, and who were perhaps



15  
ignorant only of the name of the Science in which  
they excelled, We shall now treat of the plans we mean to  
pursue. ~~in~~ We shall first treat of the general Effects of heat  
2<sup>dly</sup> of the general Effects of mixture. & 3<sup>dly</sup> of the agents  
made use of in Chemical Operations. This we owe to consi-  
der on the first part of our course. In the second part  
one more properly called the objects of Chemistry  
These are first divided into Salts 2<sup>d</sup> Earths 3<sup>d</sup> Inflammables  
Metals & Waters 6<sup>th</sup> Airs. & Animal & Vegetable Substances  
In speaking of these ~~principles~~ we shall first treat of the  
Effects of heat; secondly those of mixture, thirdly a short  
acc<sup>t</sup> of their natural History. under one or other of these  
heads we shall comprehend the science of Chemistry.

It is a natural question for young men entering  
upon this study to enquire what books they shall read  
and I must own myself at a loss to know what books  
to recommend to you. Boerhaave's chemical works  
are only useful on acc<sup>t</sup> of the Descriptions of the Operations;  
but he is often tedious & sometimes faulty & inconsistent in his history  
of the Virtues of his preparations. Boyle's works may be consulted  
occasionally with advantage. His natural history of Gold,  
the human Blood, and of Precious Stones. are worth your  
attention. Macquer's Elements of Chemistry is a book that  
that should be in all your libraries but he is faulty in points of System.



16 System, & error, even. Who say it I shall have frequently  
to mention his name only to point out his errors. —  
Fourcroy's Chemistry is an useful work. Besides  
all the modern Discoveries, you will find some good ob-  
servations on natural History — Kirwinn's Mineralogy  
may also be consulted. He is the first writer who has  
brought Chemistry to the Aid of Natural History —  
The Connection between these Sciences is very great  
It has been justly observed, that, when Natural History  
ends, Chemistry begins, and when Chemistry  
ends the Physician begins —

### Section 1<sup>st</sup>

We come now to treat

## Of Heat

We will not pretend to account for the cause of it  
Lord Bacon deduces it from the Motion, friction & pressure  
of Bodies which appears plausible, but it is not true, as  
Heat is by no means proportioned to motion, and  
motion will not explain all the Effects of Heat —  
Others derive it from the tumultuous motion or vibration  
of  ~~Bodies~~ an elastic Fluid in the pores of Bodies. Sir  
Isaac Newton calls it Ether, from which he also explains  
the Phenomena of Electricity, magnetism and  
Gravitation. There are some things which tend to prove  
thus to refute this notion. No persons have been more



more successful in their Conjectures than the two <sup>1<sup>st</sup></sup> & <sup>2<sup>d</sup></sup> Phys.  
by Heat we mean the power of exciting Expansion,  
Fluidity, Vapour & Ignition in Bodies.

The Laws of the Communication of Heat are the  
following —

1<sup>st</sup> The Communication of Heat is common to all Bodies  
and peculiar to none, always tending to Equilibrium.  
This shows the expansive power of Heat, which is always  
endeavouring to recede from the Centre.

2<sup>d</sup> The Communication of Heat requires some time  
and different Times for different Bodies —

3<sup>d</sup> Two Bodies of <sup>rough</sup> different Quantity & Quality of Matter  
but different in shape, lose or receive Heat in proportion  
to their Surfaces. The larger the Surfaces are the quicker  
are they affected with heat or cold. Thus a small Cube  
will grow hot or cold, sooner than a larger, as the former  
contains a greater Surface in proportion to the quantity  
than the latter. Thus also a good leaf will be much  
sooner affected with heat or cold, than a Gold Sphere  
or Cube containing the same Quantity of Matter. We  
shall shew this Law to be of application hereafter, when we  
come to treat of Thermometers —

4<sup>th</sup> Two Bodies of the same matter and form, but different in  
Quantity Heat & Cool in proportion to their Diameters

5<sup>th</sup> Heat passes out of Bodies quicker in proportion when  
the Layers are fewest. fewest



6. That is communicated to Bodies, quicker or slower in proportion to the contiguity of parts. Thus heat will be communicated from one cube to another quicker than from one Sphere to another, as this latter has but one point of Contact.

7. Surfaces and Bulks being given they receive or lose heat in proportion to their quality. what this quality is we know not, Muschenbroeck supposes this to be to the density of Bodies, but he is mistaken, as this is not always, *habeo* good. It is more probable that the property of conducting heat, depends upon some intrinsic Quality of the Body. There are conductors and non-conductors of heat, as well as of Electricity. Metals are good conductors of both. Wood conducts heat slowly. The property of wooden handles to vessels frequently exposed to the fire. We are not certain which is the best conductor of heat. water or Air; but it is probable water is, as bodies cool much sooner when immersed in it, than when exposed to the Air. If there is any non-conductor of heat it is air, & Heat may perhaps only be communicated by the heterogeneous particles in the Atmosphere. See now here another Analogy, between heat & Electricity.



Wool, & feathers to one non conductors of Electricity. 19  
and they transmit heat very slowly hence the propriety of  
using woolen cloaths in the Winter; hence also the utility  
in the practice of the Germans in this country in sleeping  
under a light Feather Bed, which saves a great expense  
and weight of Wood & cloaths. From these substances  
keeping us warm we are apt to think that warm in them-  
selves; but this is not the case as they will keep bodies cool.  
Thus, Ice is kept from melting in summer by wrapping it up  
in Hay, straw woolen cloaths &c; and Ice houses are  
generally lined with some rare spongy substances.

Light spongy bodies confine the Heat or do not conduct it off  
hastily. Thus we see the reason why snow contributes  
to make a soil fertile; for by confining the heat of the  
Earth it renders it moist & friable. Upon this acct it  
seems to be a wise provision of Nature in cold countries  
to preserve vegetation during the winter season.  
In Russia & Siberia upon melting away of the Snow  
the ground is frequently found covered with Vines.  
Were we not to call this to our assistance it would  
appear paradoxical that in Canada vegetation goes  
on faster than in Pennsylvania. For the Snows  
falling in August before the severe frosts, preserve



20. preserve the Earth from being affected by the successive Frosts; whereas here we have very severe frosts before the Snow falls, which does not happen till January. The frequent rains here contribute to carry the frost into the Earth. The earth here is usually frozen  $3\frac{1}{2}$  feet deep; On the side of a mountain that had a north west aspect it was found frozen. Six in the late cold winter.

Such a depth of frost is never known in Canada. As soon as the Snow is melted away, the Earth is so soft that the Furrier begins to plough as soon as the ice immediately, which he cannot do here till the frost is out of the ground. Thus economy of Nature is very beautiful and deserves our attention. Nature seems as provident of the animals as of the Earth in cold countries. The former she cloaks with a soft warm substance or fur; the latter with a downy blanket of Snow. When we speak of soft bodies being bad conductors of heat, we mean now solid bodies and not fluids. The colour of the bodies has a considerable influence in the communication of heat. It has been supposed by some that the reason why the hair grows white in old age, is to defend the heat of the nobler faculties, by preventing the heat from being carried off. We have also another Instance of



of the animals in cold countries. Those which 21.  
in the warmer climates are covered with hair, when  
taken to the cold regions lose their hair. I recure a cloathing  
of wool those also that are of a darker colour become  
white.

Heat has always an insistent tendency to fly  
upwards, this is exemplified by holding the hand  
over a hot iron, and in a clear sunshiny day, you  
may see it ascending. This does not take place in  
vacuo; as the heat there is equally diffused. Cold  
has a contrary tendency as may be seen in Ice, and  
other cold bodies, cooling bodies below them more than  
those above. This must be owing to the colder air being  
condensed & descending. Hence also sailors perceive the change  
of temperature as they approach the Land; from the air being  
cooled by the ice upon the land and falling down upon the  
sea. Valetudinarians who make a voyage for Health should  
be careful to keep themselves as much as possible from the  
open air, to increase their cloaths and use every other means  
of avoiding cold as they approach the Shore. From this we  
may solve the following Phenomenon. It is observed  
that a piece of Ice suspended in the open air in a cold  
night it will weigh considerably less in the morning.



One area of Ice will thus frequently lose a Direction and sometimes two in the course of a night. The reason of this is, that, tho the air may be cold the ice is still more. The air therefore in contact with the ice from the 1<sup>st</sup> Law will impart its heat to it, and subside and its place will be supplied by a fresh quantity, which is warmer. This will undergo the same change & the consequence will be a diminution of the weight of the Ice from a part being melted by the heat communicated from the air. This reasoning seems confirmed by observing that if the Ice instead of being suspended is laid upon the ground no such diminution takes place, the colder air cannot subside and leave room for warmer air to supply its place. From this law you will also understand why heat applied to the Bottom of Stoves heats them sooner than when applied to the surface. From water transmitting heat equally, it is employed to heat other bodies and is called *Balnum maris* or *maris*. Water never exceeds a heat greater than  $212^{\circ}$ . Hence Mr. Lavoisier proposed mercury to be substituted in place of water which receiving a greater degree of heat, will act as more universal solvent. but I cannot think it would



would answer, as it is too dense and heavy, and in large  
 quantities from the great Quantity required. From the evapora-  
 tion which takes place it would be very expensive,  
 From this transpiration of heat large Bodies of sweet  
 water possess nearly the same degree of heat in every  
 State of the Atmosphere. From this circumstance some of  
 our deep Lakes are never frozen in the coldest winters, as  
 the warmer water from below arises, and supplies the place  
 of the cold water on the surface which being condensed sinks.  
 Hence land situated near large collections of sweet water, is never so  
 cold in winter as other land in the same latitude which is  
 more remote. Thus the cold in Great Britain which is  
 situated between the 50, & 60, Degree of North Latitude  
 is scarcely ever so great as in Pennsylvania as the former  
 is entirely surrounded with water. A Question never  
 arises here, why air is not in all places equally  
 affected. The extreme cold which reigns in the upper regions  
 is truly astonishing and it well affords some pleasure  
 to account for it.

All heat at least of the Atmosphere is derived from the sun  
 Opaque bodies only are heated by its rays, and transparent  
 bodies are not affected at all. Thus a burning glass is not  
 affected by the rays of the sun it transmits. The rays are



8. 2<sup>d</sup>. one brought to a Focus in the middle of a Bucket of water. The water will not be at all heated, but if a piece of wood be wrapped in that place it will be burnt to a coal internally, for the water will prevent it from burning externally. The rays of the sun then only warm the surface of the Earth, and the air receives its heat entirely from the earth by reflection. Hence the air nearest the earth is warmest. But as air when heated is rarefied, why does it not ascend, and wait there above? This is owing to it being compressed by the atmosphere above, which is supposed to extend fifty miles. Hence the air near the surface is densest & when most rarefied is still denser than that above, and therefore cannot ascend far.

The Difference in climate independent of the Latitude depends upon —

1<sup>st</sup> The Sun's greater or less perpendicularity to the Earth.

2<sup>d</sup> The vicinity of the Lakes or large Bodies of water, which send forth heat in winter & cold in Summer. Hence Islands are warmer in winter, and colder in Summer than Continents in the same Latitude. This greater warmth over large collections of water, preserves them from the late frosts of the Spring when it has been destroyed in heats farther remote. Thus the Archangels near or within a Mile of the Delaware or within a mile of it are seldom known to fail. In the Spring 1777



The Fruit was generally destroyed in this & the neighbouring States except when growing near some water, on the shores of the Delaware, in most places it was unhurt, but this preservation was more remarkable on the Jersey shore on the Pennsylvania side, which was owing to the ice with being carried in greater quantity that way by the N.W. wind which generally prevailed —

3<sup>rd</sup> The difference of the Quality of the Soil upon which the Peas grow. Thus a stony rocky soil, is cooler than a sandy one.

4<sup>th</sup> To the contiguity of mountains which screen from the winds in winter, & cool the air in summer, for the Snow & Ice on the mountains

5 The Winds blowing from different Quarters of the Globe Thus the N.W. wind in this country blowing over the frozen lakes and immense tract of Continent covered with perpetual Snows is exceedingly cold.

6<sup>th</sup> The presence of Clouds obstructing the rays of the Sun There is another reason why Ireland ceteris paribus is cooler in summer than Continents, from the flying Clouds arising from the evaporation of the adjoining Ocean, continually hovering over them —

7<sup>th</sup> The Situation and state of Culture in the adjacent Countries. The Climate of Italy has been much changed since the time of Augustus. Horace in the 2<sup>d</sup> Ode of his 1<sup>st</sup> Book speaks of the horrors of winter as if he himself felt them.



26. <sup>them.</sup> Juvenal mentions a Custom which prevailed  
 among the Roman Youth of beating holes into the  
 and afterwards plunging into the Tiber. Travellers tell  
 us, at present it is considered as an extraordinary circumstance  
 to see snow on the Ground after 10 O'clock in the morning  
 and the Tiber has not been frozen these many Years.  
 What can this Change be owing to? It cannot be attributed  
 to the increase of Cultivation in Italy itself. The Soil of Italy is  
 much the same as it was two thousand Years ago, and indeed  
 many spots which we know in the time of Augustus to  
 be fruitful Gardens are now covered over with woods, and  
 thus remain now in the same situation as formerly.  
 It appears then to depend upon the Cultivation of the Country  
 to the northward of Italy and particularly of Germany  
 which in the time of Augustus was entirely uncultivated.  
 This Effect Cultivation produces by absorbing the moisture  
 of the Earth & thus preventing Evaporation which produces  
 cold, the Diminution of winter tears an exact proportion  
 to the degree of Cultivation. Thus, in Pennsylvania the  
 creeks and millponds have been much lessened  
 since Cultivation has been increased, some Mills which  
 formerly went the whole Year now will go but six Months  
 and thus formerly valuable Estates have from this  
 Diminution been turned into Pools.



It is probable that a change of climate similar  
to that which Italy has undergone will take place in these  
middle States. A very surprising change has already happened  
I scarcely believe that a road was formed upon the  
Ice of the River Delaware from one State to the other and used  
for many weeks by carriages; that an ox was roasted  
on the frozen River to which thousands were Spectators  
and some timorous sentook of its fall.

We now proceed to speak more particularly of  
the Effects of Heat.

We shall speak of heat only as a simple quality and shall  
speak only of its effects on simple bodies. Animal & vegetable  
substances being compounds are decomposed by heat; and  
on this acc! are not properly comprehended when we are  
treating of the general effects of heat.

Heat always produces one of the four following effects;  
Expansion, Fluidity, Vapor, Ignition.

1 Of Expansion

All bodies are expansible by heat except one which shall  
be mentioned hereafter, we shall mention two or three facts  
which prove this

All matter may be comprehended under one of these  
three heads 1<sup>st</sup> Solids, 2<sup>d</sup> Elastic, incompressible Fluids



### 3 Elastic and compressible Fluids -

Experiments prove the expansibility of such of them - The Solids are expanded by heat, is shown by an iron cylinder which when cold will pass through a bore or ring, that will not do it when hot. This may also be observed in bolting doors which will be difficult when the weather is hot, but after a few frosty nights the bolt will pass in with ease. The variation of clocks and watches depends upon the Metals of which they are composed being expanded or contracted by heat or cold. That inelastic incompressible fluids are expanded by heat or cold is shown by blowing Spirit of wine into a glass immersed in warm water. The spirit will rise considerably and take up more space than when cold, It will return to its former space by removing it to a cooler temperature. That elastic compressible fluids are capable of expansion by heat we learn, by observing, that, if a bladder with a small quantity of water in it, is placed by a fire, and suffered to continue thus for some time, the air will be so expanded so as entirely to fill it, and sometimes to burst it. Expansion and contraction are always the consequences of heat and cold. If iron be immersed into water it is rendered much less, and if heated in a furnace it becomes much larger than before. Different bodies are differently



expanded by heat, what this depends on we 29.  
know not. In general we find the densest bodies, ceteris  
paribus, expand least. This, however, is not always the case  
for some metals expand more than glass. An Instrument  
has been made for discovering the degrees of heat, ex-  
pansibility in different bodies, called a *Styrometer*.  
By this a French Academician has constructed a Table  
of the different degrees of expansibility in different bodies.  
This may be useful to artists in making new machines.  
Some artists have availed themselves of this experiment  
Hence in making large brewing Tubs, casks &c. the  
mill heats the iron hoops red hot before they are applied  
and in that condition puts them on the vessels. By this  
they apply more closely and compress the vessel more forcibly  
than from any mechanical force that can be applied.  
The same thing is practised in making the Mill Stones  
which are commonly called the French Mills. These are made  
of a number of small stones cemented together with Blaster  
of Paris. The hoops contracting on growing cold, renders  
the stone more compact than they could be otherwise  
made. Water is almost the only Body in nature which  
is an exception to our general rule, and resists the contracting  
power of cold. This fluid rather increases than diminishes  
in Bulk when converted into ice In order to be assured



30. In the Truth of this Fact, Mr. Boyle put some water into a  
 tube three inches in Diameter and on it a weight of 70 lbs  
 on then exposed it to an intense cold the water was not soon  
 frozen, then it was so enlarged that the weight placed on  
 was raised considerably. In like manner Mr. Huggins by  
 a Cannon by filling it with water and then exposing it to a  
 cold below the freezing point, producing this mighty effect  
 the expansive power of Cold on Water. Muschenbroeck  
 computes the resistance overcome to be equal to 200000 lbs  
 and says the water increases  $\frac{1}{10}$  in Bulk. The Florentine  
 Academicians put some water into a tube of Brass  
 three inches in Diameter, and exposed to a freezing mixture  
 at first the tube was so strong that the cold had no effect  
 on it, but upon being bent & set off, it was burst with violence  
 by the expansive power of the ice. From hence we learn  
 why gentle rains succeeded by Frost, so greatly subvert the  
 Earth; for the moisture insinuating itself into the cracks  
 being then frozen by its expansive power, crumbles the  
 earth into small pieces; this melloweth the ground and makes  
 it to be more easily penetrated, by the roots of Plants and  
 the external air, the last of which not a little promotes  
 vegetation. Hence also we learn why pavements break  
 soon after a sudden thaw; why uncased houses moulder  
 away gradually after a long and cold winter —



and why Conduit pipes are so frequently burst 31.  
after a cold winter. This is from their running too near the  
surface of the earth, so that the frost has crept to them &  
frozen the water in them. Philosophers have been puzzled to  
account for this increase of bulk. Hæmberg thinks this  
Expansion is due to the air contained in  
it, which he says may be seen in the form of Bubbles  
in the most solid lumps of Ice. But I would object to this  
1<sup>st</sup> That it is the uniform effect of cold to condense air and  
not to expand it. But waving this consideration,  
2<sup>nd</sup> Mairon & Muschenbroeck after depriving water  
of its air, upon exposing it to cold found that it was  
still frozen and expanded as before, and with the same  
appearance of Bubbles. 3<sup>rd</sup> Dr. Hales has put the matter  
out of dispute; for, having put a piece of ice under water he  
pierced little holes into them Bubbles and found that no air  
rushed out quickly or with any force, which would have certainly  
been the case had there been any present, especially  
if in that Case in which Hæmberg supposed it to be M. Mairon  
prepared an opinion of his own, and attributed it to the  
strong tendency which the particles of water have upon their  
conversion into ice to cut each other at angles of  $60^\circ$ . This  
seems to be seen 1<sup>st</sup> from the appearance of ice when rough  
and angular 2<sup>nd</sup> from the resemblance to Snow, which is



32. is vapor frozen in the air. This form of snow has by  
 some been attributed to saline effluvia. But this cannot  
 be the case as snow water has been found by Mr. Mangrady  
 of Berlin to contain no salt but to be quite pure. As  
 this is the case, it affords a strong presumption in favor of  
 truth of this Hypothesis of M. Hailan. Water is not the  
 body that resists the contracting power of cold. M. Hauman  
 has found another description. He has found that several Metals  
 particularly iron, expand upon passing from a fluid to a solid  
 state form. This has been attributed by artists to a cavity  
 in the iron which cannot be the cause, as this cavity is  
 in other Metals, which are not expanded by cold. This increase  
 bulk in iron appears to be owing to the particles touching  
 at angles and not uniting intimately. Hence cast iron  
 not so compact & durable as wrought iron. That expands  
 inelastic bodies will astound force. The following experiment  
 does not absolutely prove that water is not in compression.  
 The compressibility of water has been proved by a late writer  
 in the Philosophical Transactions, M. Canton. Upon  
 taking of the pressure of the Atmosphere he found the  
 water expand insensibly and rise in the Tube. Hence we  
 may conclude that water in its natural state is more  
 or less in a state of compression by the superior current



33.

(Atmosphere). The great expansion of this fluid  
by heat is rendered evident by the simple experiment  
of a blacksmith on an anvil and giving a moment  
stroke with his hot iron. Bodies that are increased  
by heat & diminished by cold suffer no alteration in  
weight. Muschenbroeck says that when metals  
are melted they lose a few grains of their weight, which  
they recover when cold. But this small difference  
in weight appears to be owing to the air about the  
melted metal being scraped. Musch. also tells us  
that metals when calcined are heavier than when  
in a solid form. Thus 100 lb of lead after calcination  
will weigh 100. This, as will be shown hereafter is owing  
to the absorption of pure or dephlogisticated air.  
No bodies contain a definite or certain quantity of  
heat, nor do we know how far they may be expanded  
or contracted. Some Philosophers assert that could the  
air by any means be reduced to its heat, it would become  
as hard and solid as gold.

Expansion leads us to speak

### Thermometers

Thermometers are very useful in experimental  
Philosophy & medicine. They are chiefly observed in their  
the fallacies



34. structure and use. The bodies best adapted for the construction of thermometers are those that are most sensible of heat. Therefore fluids are chosen, but they have a disadvantage as they cannot bear a great degree of heat without boiling or evaporating. This is however in a great measure avoided by Sir Isaac Newton's calculation, of which we shall speak hereafter. The fluids employed in making thermometers are Air, Alcohol, Oil, & Mercury.

Air is very sensible to heat & cold and was first used in making thermometers. Sanctorius's attempt was rude and imperfect. Mr. Boyle improved upon him, and carried it to some degree of perfection. From its great sensibility to heat and cold air answers very well in many cases, but its expansibility is so great, that it requires a very long scale when used in thermometry. It is also considerably affected by the circumstances of the ambient atmosphere with respect to moisture or the contrary, & is thus rendered unfit for general use. The air thermometers only fit for transitory experiments. Perhaps it may answer better than any other. Alcohol coloured with cochineal has also been used. This is good on account. It is very sensible of heat, expands readily and contracts easily, but it is inconvenient on one account that it does not show great degrees of heat as its boiling point is higher than that of water. It has one advantage that it will not change colour.



Vegetable expressed oils have been used for Making Thermometers. They bear a great degree of heat or cold without boiling or freezing. But at a certain degree of cold they become useless by growing very viscid. They also always soil the tube so as to render it opaque. Mercury is generally used and is possessed of more advantages than any other. It will not boil until a great degree of heat is applied. Its expansion is not so great as to require a long scale; but it is sufficiently great to distinguish very small variations in the temperature of the air. From this quality it is best calculated for accurately distinguishing the changes in the temperature of the atmosphere.

We shall now make some observations on the construction of Thermometers —

Mr Wilson of Glasgow is the most perfect artist in Europe in the construction of Thermometers. From him we learn that the accuracy of Thermometers depends on the following particulars. The stem should be very straight. In proportion to the size of the bulb with respect to the stem will the mercury rise. The larger the bulb is in proportion to the stem the greater will be the scale & the expansion the more evident, but its sensibility to small degrees of heat less as appears from the third law of the communication of heat. The glass of the bulb should be as thin as possible. The bulb should not be quite spherical



36. but rather in the form of an oblate spheroid in order to increase the surface which renders it more sensible as appears also from the third law. Its perfection depends upon the uniformity of the cylindrical tube. It is usually considered as a necessary step wholly to extract the air. But Mr. Wilson finds that the air does not counteract the expansion of the mercury, & that it is therefore unnecessary to extract it.

The bulb of the thermometer should not be too bright, by reflecting the heat the mercury would not rise as it otherwise would do. This was observed by Mr. Batt Wilson son of the former Mr. Wilson. He one day saw a thermometer of his own hanging in his room, the bulb of which was very bright, to stand lower than the thermometer in the College. He suspected this to be owing to the brightness of the bulb, & accordingly on adding it with ink he found that it rose equally w. <sup>the</sup> other.

As to the graduation of thermometers, the scale is to be applied after the tube is filled. Certain standard points are upon which are generally the boiling and freezing points of water. We are much indebted to Dr. Nentz for his experiments on this subject. He found that the points at which the mercury stood when water was freezing or boiling were constantly the same. The intermediate spaces



between these two points is divided into equal portions<sup>32</sup>  
called degrees. Fahrenheit's thermometer, which is an improve-  
ment upon Newton's, is at this day generally used in  
England, Holland & this Country. In different countries  
different thermometers are used, as that of Reaumur in  
France &c

In graduating thermometers we should take the  
boiling point of water in a mean state of the atmosphere; i.e.  
when the mercury rises 29 $\frac{1}{2}$  inches in the barometer; as  
when the weight of the atmosphere is less water will boil  
with a less degree of heat than 212°. & vice versa.

By thermometers our ideas of heat are much enlarged.  
From these we learn that no bodies in nature are so cold  
but that they contain some heat, and may turn made colder.  
However paradoxical it may seem snow may be rendered  
colder by the addition of salt.

Heat is a positive & cold a negative principle. We are apt  
to imagine that fluidity is the natural state of water, but this  
is a vulgar error. There are many substances besides water  
which are fluid when hot, but become solid when cold. It is  
probable that Lead & tin would be constantly in a fluid  
state in the planet Mercury. Our language tends to keep  
up the vulgar error of cold being a positive principle.



38. and indeed both heat and cold tend to excite positive ideas. To consider heat as a positive principle and cold as a negative seems to be the best way as we know not where one terminates or the other begins. We are apt to consider below the temperature at which water freezes as cold & above it hot; but water in the same temperature will excite the sensation of heat or cold according to the state of the body. Thus, you see that I consider heat as an absolute quality, & derived from the sun: and cold as a negative quality if I may be allowed of expression and depending entirely on the absence of the same heat. I shall not here take notice of the opinion of Sweeten and others that cold is produced by short spicules, but shall show hereafter that it depends entirely upon the absence of heat.

There is one derivation which should have been made above with regard to the placing of thermometers. They are generally placed in the shade & against walls. They are considerably affected by the materials of which the walls are made transmitting heat faster or slower the best method therefore would be to suspend them in the air from the ceiling—



We shall now further consider the history of cold. 39  
Philosophers who were sent by the King of Sweden to measure  
a degree of the earth at the polar circle suffered exceedingly  
from the cold. They were deprived of the sun for several months  
and were obliged to keep themselves constantly in a close room.  
Upon opening their door, the moisture exhaled from their  
lungs as soon as it left their mouth was frozen and fell at their  
feet in form of snow. In inspiration they felt a disagreeable  
sensation of cold in the breast. Spirit of wine froze here.  
The mercury fell to  $33^{\circ}$  below 0 i.e., 65 below the freezing point.  
In Siberia the natural cold is still greater. This may be  
owing to its great distance from the sea. Professor  
Amman tells us that the mercury fell to  $155^{\circ}$  below 0.  
Notwithstanding this great degree of cold, the finest and  
rarest plants flourish here. Dr. Murray informs us that the  
Potatoc originally from Mexico, flourishes in Siberia.  
This will tend to enlarge our ideas of vegetation & may be of  
service when we come to treat of vegetable substances.

Dr. Boerhaave was struck with surprise at a degree of  
cold  $32^{\circ}$  below 0. a more intense cold than this is produced  
by mixing snow and aqua fortis together. The mercury  
in the thermometer when placed in this fell  $42^{\circ}$  below



40° below the freezing point i. e. 40° below 0. in Fahrenheit  
 Dr. Lichtenberg a more intense cold even than this was  
 produced according to Mr. Braun's experiments. The tube  
 us that the mercury on immersing the thermometer in  
 mixture of snow & aqua fortis fell 35.2° below 0. on breaking  
 the tube the mercury was found converted into a solid form.  
 The natural temperature of the atmosphere was at this  
 time 40° below 0. The spirit of wine thermometer at the  
 time stood at 180°. at this point the tube generally broke  
 & the mercury fell several hundred degrees. These experiments  
 do not seem by any means to be conclusive. 1. The tube  
 generally broke and part of the mercury escaped. 2. When  
 it was froze or was converted into a solid form it contracted  
 suddenly & irregularly with a concave appearance on  
 surface similar to what other metals have when  
 they pass from a fluid to a solid form. 3. The mercury  
 fell far below the degree at which the spirit of wine ther-  
 -mometer stood which was 180° below 0. at this point it  
 contracted immediately and froze suddenly. It is probable  
 that 180° below was the greatest degree of cold pro-  
 duced in these experiments.

Thermometers point out to us the degrees of heat & cold



11  
ceto. 2 They teach us the distribution of heat from one  
body to another. Thus, take a number of metals; let some  
be hot and others cold: place them all together. In a little  
time apply a Thermometer and you will find it shows  
the same degree of heat in all: which we distinguish by  
the name of an equilibrium of heat. Do all bodies  
contain an equal degree of heat? Dr. Prochaska & Muth  
brock are of opinion that they do: What a cubic inch of  
all substances, such as metals, water, leather, air &c.  
contained an equal quantity; but a little reflection will  
convince us that this opinion is ill founded: for a hot iron  
contains more heat than an equal quantity of wood  
though exposed to the same degree of heat. This equilibrium  
of heat is not to be known by any fixed principles; but is  
to be found only by experiment. A kind use of Thermometers  
is to teach us the degrees of heat above the scale of thermom-  
eters themselves. In order to do this. to find the heat of a red  
hot iron for instance, we throw a piece of iron into a certain  
quantity of water; from this we may easily find the heat  
contained in the iron. For, by observing the temperature of  
the water before the immersion of the iron, & then finding  
how much heat the water has gained, we may tell pretty



8  
112 pretty exactly how much heat the iron contained.  
To do this first compute the quantity of matter contained in  
the iron: then find the quantity of water, e.g. if the iron  
contains a cubic inch, find how many cubic inches  
the water contains, & afterwards multiply the quantity  
of heat which you find the water has gained, by the  
number of cubic inches it was found to contain, & this  
gives the heat of the iron. What confirms the truth of this  
method is that it corresponds with the method used by Sir Isaac  
Newton for ascertaining the same thing. This Philosopher  
after the heated substance was become somewhat cold,  
applied the bulb of a thermometer in a cavity which  
formed in it, & afterwards noted the degrees of heat it lost  
a given time. From this he calculated backwards, & thus  
found the degree of heat in the body when first taken from  
the fire. A<sup>th</sup> use of thermometers is to find the time  
which bodies take to heat & cool, & in what proportion  
they lose & receive heat. To this accurately it is necessary  
that the heating & cooling causes should be the same.  
Hence the body should be exposed to a current of air,  
for when this is not the case the heated air is accumu-  
lated about the body, & thus it will not cool so fast.



as it otherwise would. We may here explain the <sup>43</sup>  
reason why still air appears hotter than air in motion.  
When the air is in a state of rest it receives heat from our  
bodies, & accumulates it around them; but when it is in  
motion, it carries the warm atmosphere from around  
us, & hence windy weather seems the coldest. But it is  
not colder, as you may be convinced by taking a pair of  
bellows & blowing against a thermometer, when the mercury  
in the tube will not sink in the least, on the contrary it  
will rise; for the heat generated by the friction of the  
wind against the bulb, is sufficient to cause this ascension.

We may also in the same manner explain why ice  
when blown upon, is melted sooner than in still air  
viz. by the cool air around it which would otherwise  
remain there, being carried off its place constantly  
supplied by warmer air.

We come next to speak of the second general  
effect of heat viz. —

## 2. Of Fluidity —

Fluidity in all bodies is in consequence of the  
action of heat. Many reasons concur to establish this  
assertion



<sup>144.</sup> assertion. We find most many bodies naturally solid  
 become fluid by being exposed to heat; for the contrary  
 others that are naturally fluid become solid by cold.  
 Spirit of wine & others do indeed remain fluid in any degree  
 of cold which has been as yet produced, but I have no doubt  
 but they might be rendered solid, could we not them of  
 sufficient quantity of heat. Mercury which was formerly  
 thought to remain constantly fluid, has lately been  
 rendered solid by cold. There are some substances in  
 nature, as certain salts and stones which have never  
 been made fluid by heat; tho' this is no argument of  
 their being absolutely infusible; for there may be a greater  
 degree of heat than we are yet acquainted with. From  
 experiments that have been made with lenses, it is  
 probable, that a lens might be so constructed as that it  
 melt the hardest bodies in nature, especially if certain  
 substances were added to flux them. By a late account  
 we are informed that the Bonisier Academicians have  
 fused a diamond by a pentagonal burning glass. This  
 opinion of fluidity being always the effect of heat is denied  
 by Muschenbroek who asserts that water is naturally  
 essentially fluid, What its freezing is owing to certain  
 extraneous



extraneous matters existing in the air which he called <sup>45</sup>  
siccific particles, & introduced into the water. He produces  
several propositions in support of his opinion. I shall take  
notice of & refute them separately —

1. That water remaining at rest, or when kept very quiet  
tho the temperature of the air is below the freezing point  
does not congeal till agitated; it then immediately freezes.  
He thinks by agitating or shaking the water that some  
foreign body is introduced & more intimately mixed  
with the water. This may be owing to the water being  
something warmer than the surrounding medium,  
being heated with its heat slowly. The agitation may  
occasion some evaporation & disengage the small  
quantity of superabundant heat. —

2. That frost will continue sometimes at  $36^{\circ}$  Reaumur  $18^{\circ}$   
of Fahrenheit's thermometer. This we cannot deny as it  
has been observed by Wolffius in Germany & Reaumur  
in France. This may have been owing to the long time  
Ice & snow require for receiving heat or melting; and it is  
probable the thermometer would have stood at  $32^{\circ}$  near  
the surface of the earth, & that the air above was somewhat  
warmed by the sun. The difference in the nature of the soils



46. soils on which they lie will also have a considerable effect. Thus when lying on a sandy soil, snow soon melts but when on a cold clayey soil will continue frozen days.

3. He observed to see a thaw when the mercury stood

30° or two degrees below the freezing point. This we don't deny. It might be owing to a considerable frost preceding the freezing, water parts with its heat as we shall see here.

It might likewise be owing to the thermometer being placed against a wall, & that being a long time in communicating or receiving heat, which is generally the case;

The snow or ice might lie on a warm sandy soil.

4. That there is frequently a hoar frost on vegetables, straw &c. & on light bodies when snow can be perceived on the ground. This is to be accounted for from the 2<sup>d</sup> law of the communication of heat viz. That the surfaces & bulks of bodies being given they lose or receive heat in proportion to the quality of their matter. This frost is observed on several bodies only —

5. He often observed frost in April many times, after many warm days, & boldly pronounced that this could not be owing to water being robbed of its heat. This may be accounted for from evaporation producing cold. Such transitions



are very common, and warm days are very often  
succeeded by cold nights. 147

6 That fogs are frequently observed in the southern, tho, there  
are none at the same time in the northern countries of  
Europe. This might be accounted for by the vicinity of these  
northern countries to the sea, or to their being surrounded  
by water, which tends to make a country warmer.

7 That the quickness of freezing in stagnant water  
is not proportioned to the degree of cold. This depends upon  
the quicker or slower motion of the air. When the air is  
in motion, the warmer will be carried off, & the colder supply  
its place. Thus the water will be sooner cooled of its heat.

The quickness of freezing is in a ratio compounded of the degree  
of cold and the agitation of the surrounding air.

8. That a mixture of Salt and snow placed over the fire will  
freeze water placed over it. which Muschenbroeck thinks is  
owing to the frigorific particles passing from the mixture to  
the water. This is by no means a superfluity. The cold  
produced by the mixture is so great as to freeze the water  
long before the fire can extend its heat to it.

9. Aqua fortis, or nitrous acid when joined with ice produces cold  
when mixed with water, heat. It ought to have been

remembered



As. remembered that ice & water possess very different properties, & we cannot account for the cold evolved in the former case, & the heat extracted in the latter; without bringing in the frigorific particles —

10. We sometimes during the night see no hoar frost or ice on the ground, but after the sun rises we are soon covered over with crusts of frost. This is undoubtedly true. Muschenbroeck in this case supposes that no frigorific particles exist in the air in the night time, but that they come in in the morning. This may be owing to the rays of the sun occasioning evaporation, & that produces cold. The cold in the night may not be sufficient to freeze water, but so near is that when evaporation takes place the cold produced will more than counterbalance the heat of the sun; consequently congelation will take place. We shall hereafter show the connection between evaporation and the generation of cold. —

11. Ice water Muschenbroeck observes is scarce until cold. Boiling he supposes dissipates the frigorific particles. But this is observed to be different by others. His hard water means such as will not easily dissolve soap or boil regularly. The hardness of snow or ice water is very transitory



And owing to its extreme coldness, for which we need it is<sup>119.</sup>  
as soft as rain water. —

12. He says that the inhabitants of the alps are afflicted with  
a disease called guttur humidum (quod guttur humidum  
mucatur in alpebus. <sup>2</sup> Job.) which he attributes to their  
drinking snow water impregnated with these imaginary  
frigoris particles. This argument has no force at all, as all  
those persons who live on the alps and drink snow water are  
not afflicted in this manner; neither are the inhabitants  
of the ardes, who also use snow water as freely as they do  
upon the alps. —

13. That all bodies contract by cold except water, which is  
enlarged when it becomes ice. What can this be owing to  
says Muschenbroeck but to the accession of some frigorific  
particles? Ice however is not heavier than water. This he  
allows but says it is owing to the extreme minuteness &  
subtlety of these particles. He did not consider that regulus  
of Antimony & iron expand upon passing from a solid  
to a fluid <sup>to a solid</sup> state. Can these cooling particles enter into these  
substances when they are red hot? No. It cannot therefore  
be owing to the absorption of frigorific particles  
that ice expands is owing as we before have observed to a  
crystallization taking place; consequently interstices must  
be left —



50  
Van Swieten in his commentaries on Boerhaave's  
aphorisms admits this theory of frigorific penticles. Hence  
in speaking of that kind of gangrene which arises from  
limbs being frost bitten, he advises cataplasms of snow  
or ice which he imagines prove useful by extracting the  
frigorific spicules: but this notion is false. A cataplasm  
kind acts as a stimulus & produces a vigorous circulation  
in the frost bitten limb. Van Swieten calls into his  
assistance the analogy of a frozen apple. He supposes  
that cold water produces its effects in thawing a frozen  
apple by attracting the frigorific penticles which he says  
may be seen in the form of spicules on the surface of the  
apple. But we account for it thus. The water in which  
the apple is immersed steals with its heat so it until there  
is an equilibrium produced. The water more immediately  
in contact with the apple communicates its heat to it  
more fully & quickly. It therefore is frozen & forms numerous  
spicules which adhere to the apple. Thus these spicules are  
not extracted from the apple but formed in the water.  
Warm water has not the same good effects upon the  
frozen fruit in to it, for it imparts heat to them so rapidly  
that it destroys their texture -  
After what has been said we have reason to believe



51.  
That fluidity is the natural state of all bodies and that  
all substances can be turned into fluids to which we  
can apply a sufficient degree of heat. We therefore  
conclude that all solid bodies that we see are frozen. It  
has been commonly supposed, that the fluidity of water  
depends upon the spherical figure of its particles; but  
this is by no means the case: for all bodies then must  
consist of spherical particles as they all may be rendered  
fluid by heat.

This difference between expansion & fluidity is that in  
the first there is a regular progressive increase of bulk according  
to the degrees of heat applied; but in the 2<sup>d</sup>. the transition is  
sudden. There are certain points which are called freezing or  
coagulating points at which all bodies become solid.

These are different in different bodies; but are very constant  
in the same body. There are a few bodies that have an inter-  
mediate state between fluidity & solidity, as wax, resins &c.

We shall now explain a few chemical terms. Those bodies  
which are solid in the common temperature of the  
atmosphere and are capable of becoming fluid by heat,  
and afterwards restored to their former state are said to be  
capable of fusion. Ice, salts, & metals belong to this class.  
Those bodies that do not assume their former appearance



52. but become smooth and transparent after fusion or  
said to be vitrified, or to have undergone vitrification. To the  
class belong earthen, stones, & some metallic calces. And  
when metals undergo this operation it is called scorification.

Fluidity depends upon the presence of heat in a latent  
state or quiescent state as well as in a sensible state. The  
curious property by which heat directs itself of its own  
characteristic mark, that of being perceptible to the  
thermometer or the senses was first discovered by Dr. Black.

He has assumed that heat exists in two different states. One  
he calls absolute or latent heat, the other sensible. To illustrate  
this he made the following simple but conclusive experiment.

He took two iron pots of the same size, & heated them  
in to the one he put a pound of water & into the other a pound  
of ice. He found that the water received presently  $212^{\circ}$   
but the ice after melting had acquired only  $140^{\circ}$ . He there-  
fore concluded that  $72^{\circ}$  must have been absorbed, & become  
latent in the passage of the ice from solid to a fluid state.

The cold generated by the solution of ice in nitrous acid  
owing to the conversion of sensible into latent heat; &  
heat arising from the mixture of vitriolic acid with water  
is occasioned by the conversion of latent into sensible  
heat. — From hence we see the reason why the mixture



weather is generally moderate before a fall of snow, as it must in its formation part with a quantity of its heat to the atmosphere. And, on the contrary, we see, that the coldness & rawness of the air, attending a thaw, is owing to the absorption of heat, or the conversion of sensible into latent heat, upon the melting of the ice or snow.

All fluids contain a quantity of heat in a latent or quiescent state. The ocean abounds with it; & it is probable, that, by the conversion of this into sensible heat, the earth will be prepared to undergo the great change at the general conflagration. Hence we see the Infidels on a void of faith as philosophy, when they assert that the waters of the aqueous globe will prevent the effects of fire. So far from this, it is probable that the ocean may contain in its watery bosom the fire that is destined to wrap the earth in flames at the last day. To begin the aqueous scene it is only necessary for the great creator to let go the chain which confines in the ocean its immeasurable quantity of <sup>latent</sup> heat.

As we have already considered the history of cold, and its effects upon several of the objects of chemistry, we shall here extend this to snow & more, viz. animal bodies.

We have already spoken of measuring the degree of heat & cold. We shall now mention the methods of preventing the pernicious & mortel effects of cold —



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The human body is so contrived as to receive an uneasy sensation of cold when the mercury falls below  $62^{\circ}$  of Fahrenheit's thermometer. This uneasiness increases as the mercury descends, until it becomes painful. Animal bodies have a power of resisting the effects of heat or cold to a certain degree. Heat lessens and cold increases the action of the causes generating heat in the system, thus prove the means of obviating their own bad effects. But sometimes the degree of cold is too powerful to be overcome by the efforts of nature. In such cases the physician must call in the aid of art. And it will be pleasing to the philosopher to enquire how the means commonly employed for this purpose, produce their salutary effects; and when they are too weak we must endeavour to increase them.

The first method we shall recommend is the use of the cold bath. We need not adduce the Indians of this country as vouchers of the utility of this practice. All those who use the cold bath agree, that it renders the system less sensible of cold. Hence it is used to fortify children, & by the rigor which it gives to the system, renders them less liable to the effects of cold.

2<sup>d</sup> Wearing loose garments of fur & wool. Thus we are apt to imagine we warm ourselves; but they are only so from transmitting heat less fully than linen, silk &c. Loose garments were formerly much worn by



56 by the Romans & even now by the inhabitants of  
as being warmer in winter & cooler in summer. They  
overcome in winter by confining the perspiration  
greater quantity. When the perspiration is carried  
quickly the body is kept cool. Hence the difference  
windy & calm weather, Hence the reason why differ-  
persons are so differently affected by the same state of  
atmosphere, by the perspiration being carried off  
quicker or slower.

The 2<sup>d</sup> method is commonly said to consist in avoid-  
ing heat & thus hardening the body. This is an universal  
prevailing opinion, from a supposition that heat  
increases the sensibility of the system; but numerous  
facts that show not with this appears in some  
an avulgar error. The Germans who are gener-  
ally almost constantly in warm stove rooms. The  
which is from 86 to 90 degrees one the most robust  
& healthy people amongst us, are able to resist the  
effects of cold. The West Indians been cold as well  
than the natives of this country. The heat of the  
climate is seldom under 66°. In Siberia the Russians  
use a vapor bath twice a week, the heat of which is  
afterwards plunge themselves into the snow. The  
heat of their stove rooms is generally 104°. By this they



will beaver, work the out whole days without coming 5<sup>th</sup>.  
near a fire. The coldness of their climate may be judged  
from their earth being covered eight months in the year  
with snow, that the ground is frozen ten feet deep, and that  
the mercury in the thermometer seldom rises for  
many months above 0. From these facts it is not  
probable that heat produces insensibility to cold?

May not heat & cold produce reciprocal effects in the extremities  
of the nervous system? Assist each other in strengthening  
the system? It is however only a very great degree of heat,  
or a moderate degree long continued, which will have  
the effect of producing insensibility to cold. Hence  
the reason why we cannot bear the cold of our climate  
so well. because the heat of our summer is not intense  
enough, or does not continue for a sufficient length of time  
to fortify us against the coldness of the winter. Europeans  
bear the heat in the west indies better than the natives.  
This sufficiently refutes an argument brought in favour of  
the slave trade or taking negroes to the west indies.  
If a European escape for the first year he will do more work  
than several negroes. The country from which the negroes  
is so fruitful that almost every necessity of life is spontane-  
ously produced. The inhabitants therefore live without labour.  
Labour in warm climates is not conducive to the health of man



59 It appears that he was not destined for it in these  
circumstances by the creator. Altho' it be granted that  
the natives of cold climates bear heat, better than those  
of warm climates, yet it will not be so readily allowed  
that the reverse takes place. Thus it is the common opinion  
that New Guinea negroes will not bear the cold so well  
as the natives; but my observations do not confirm  
this notion. The circumstances that give rise to it may  
be accounted for by that languor & depression of Spirits, which  
are the natural consequences of slavery, & of their being  
ill clad. The 4<sup>th</sup> method is to keep the feet warm. They  
of cold countries first felt, on acct of their remoteness from  
heart & brain. The Indians seldom feeling inconvenience  
bein sleeping in the open air if they have their feet  
fire. There are several ways of keeping the feet warm.  
by wearing loose coverings to them. For this purpose the  
or Indian shoes are very well calculated. In Canada  
1759 the soldiers who wore the moccasins had not the  
feet frost bitten, whilst those who wore shoes, were exposed  
to the same inclemencies of weather, were affected in the  
above mentioned manner. But 2<sup>d</sup> if the feet are  
cold so as not to admit of motion, as walking during  
exercise, if this happens to more than one in company



company. The method used by a gentleman of the 59.  
Delaware state may be used with advantage. He  
attempted to cross the Chesapeake Bay late in the evening;  
but was frozen up in the middle of it. The prospect was gloomy,  
and there was no appearance of relief. He found his feet  
growing exceedingly cold. To relieve this he pulled off his  
boots, rested his feet against the ferryman's breast, after lying  
down in the boat, suffering the ferryman to do the same  
to him, and covered both with his great coat. After a while  
they fell asleep. He slept all night. The gentleman awoke  
in the morning in a sweat. Found the ice sufficiently hard  
to lead his horse ashore. I have another fact. A gentleman  
was walking to town late at night. He was overtaken  
by a very heavy storm of snow, & lost his way. He lay  
down at the foot of a tree expecting certain death. His dog  
came & lay down at his feet, as willing to share his fate.  
After some time he found his feet warmed & fell asleep. In  
the morning he awoke covered with snow & pursued his journey  
to town in perfect health. 3.<sup>d</sup> Method of the feet in cold water  
or plunging them in snow; thus exposing them to a greater  
degree of cold. The Indians break the ice & plunge their feet



8  
60. into brooks to warm them, when they begin to grow  
I have heard that our celebrated countryman Dr. Franklin  
makes practice of standing on a marble slab when  
to remove the coldness of his feet. Cold long continued acts  
as a sedative. A greater degree acts as a stimulus, and causes  
the vessels to action. In a certain degree cold is for a while  
nutrient. After which it acts as a sedative. A greater  
degree will then act as a stimulant. We may all  
have observed that we cannot sleep with cold feet. There  
is an intrinsic provision of nature to prevent us from sleeping  
the sleep of a beast. If a person can go to sleep with cold  
feet he is not in health. As it is frequently so convenient  
to jump out of bed, it will be sufficient to throw your feet  
from under the clothes.

The fifth method is wrapping up or rubbing the affected  
part with ice or snow. This is a common practice of the  
the Germans, Russians, and other inhabitants of the  
northern parts of Europe. The action of this may be  
be understood from what has been just now said.  
Sixthly. Suppose a person has endured the utmost  
extremity of cold & has been torpid & numb; it is the  
common practice to use frictions & pour down  
spirituous liquors.  
excess, if this happens to more or less



The former is in no case to be omitted; yet it will frequently fail, as the vessels on the surface are too torpid to be roused by it, & even if they are roused by it the internal parts will not perhaps be excited into action. Spirits are improper as they operate slowly & in confusions have no action at all, owing to the habit they have been in of taking them frequently. A fact which I have met with may lead to some useful practice in these circumstances. A man in riding some distance was so benumbed by the cold as that he fell from his horse. After some time he awoke with violent vomiting & hungering. He recalled that just before his fall, he had a large quid of tobacco in his mouth, which he supposed he had swallowed; & to this circumstance he ever afterwards attributed the preservation of his existence in this world.

There are two facts which it may be proper to explain. 1. why a damp day appears colder than a dry one, when the thermometer stands to the same degree of heat. The moist air in the air acts as a conductor and carries off the heat of the body.



62. <sup>Q. Why</sup> The sense of heat in summer is greater on a  
damp day than the thermometer stands but at 80°  
in a dry day when the mercury stands at 85° or  
90°. In the moist day the air being already sa-  
tiated with vapour will not carry off the perspiration  
so well as in a dry day.

We shall next make some observations upon  
the means of preventing the disagreeable effects  
of heat upon the human body.

First, Great regard is to be paid to the situation  
& construction of houses. In this country houses  
facing the South are coldest in summer but  
contrary in great Britain. Most of our cold breezes  
in summer come from the South west or south  
The cold breezes in this situation will be more  
obviously ensured to you if you have a narrow avenue  
leading to your house which will increase the  
velocity of the air. This is explained by a law  
in hydraulics, that lessening the channel  
increases the velocity.



63.  
With regard to the materials of houses stone  
seems to be the coolest. The walls must be very thick  
whatever they be composed of that the heat may not  
penetrate. Houses thus constructed are not only cool  
in summer but warm in winter. It is likewise of con-  
sequence to exclude the sun as much as possible not only  
by ~~excluding~~ the window shutters but also the cashes.  
It is likewise of consequence to have a chimney in each  
room, by which means a constant circulation of air  
will be produced. From ten in the morning till five or six  
in the evening there is a current down the chimney.  
It is then stationary for about an hour. or an hour & half.  
Afterwards it changes upwards. From this current through  
the chimney it is that the coolest seat in the room is  
nearest that part. In the chimney the air is of an  
uniform temperature throughout. By 10 O'clock the sun  
acquires sufficient heat to rarify the air above. It there-  
fore rises into the chimney, & thus throws the air contained  
in the chimney down into the room. In the evening  
after 5 or 6 O'clock the air below being more rarified than  
that above rushes up & thus forms a current up the  
chimney. Bedrooms particularly should have



64. Chimneys, as it is unsafe to leave the doors  
windows open, which we must do if they are within  
chimneys. I will go further and assert that it is  
necessary to have chimneys even in cellars, & that  
are then of considerable advantage 1.<sup>st</sup> For preserving  
vegetables which will never grow mouldy under these  
circumstances in cellars. 2.<sup>nd</sup> For preventing damp, which  
sometimes prove noxious. When they ferment, they  
may produce putrid diseases. Another means of guard  
against the oppressive effects of heat at night is, to lie on  
mats or not so. Hence mattresses are proper, which  
not increase the perspiration hence are not so weak  
to the system - The second method is by an attention to  
clothing. Every body knows that the cloaths should  
thin in summer. Silk & cotton are preferable to linen. It  
has been proved that linen is not so wholesome  
worn next the skin as woolen or cotton. especially  
the linen cannot be changed frequently. The  
lower the outer garments are the better hence gowns  
are preferable to light broad coats.

Thirdly by having a due regard to diet. Ann



Animal food increases heat more than vegetable<sup>65</sup>  
as being more stimulant. Alab. writer supposes  
that all the heat of the body is derived from the food  
which is taken in, & supposes that animal food contains  
it in larger quantity than vegetable. It may be so.  
But independent of this, we may account for the heating  
effects of animal food from its stimulating property.  
Therefore in summer less animal food should be used & more  
vegetable.

The fourth method is by paying a due attention  
to drinks. In this climate it is impossible in summer  
to avoid drinking a great deal. The more ascendant  
drinks are the best, as beverage, weak punch &c. All  
stimulating drinks are particularly to be avoided;  
as strong wines, spirits &c. There is not a more absurd  
opinion than that which prevails among the  
country people, that spirits fortify the body against  
the effects of heat. It is certain that a man who drinks  
vinegar and water, buttermilk & water with stored  
heat kills men. The man who drinks his spirit or quantity  
of spirit every day; for tho by its use he may be en-  
abled to make greater exertions for a time, yet



66. Yet this exertion is entirely convulsive & soon  
succeeded by debility -

Thy. Moly. tranquility of mind is absolutely necessary.  
Hence those who complain the least, suffer least from it.  
Persons of an irritable heart of an unsophisticated  
unguarded temper, who fret & fume & are continually  
running from place to place suffer much more than  
persons of solid & stolid dispositions who resist & struggle  
themselves to be cooled by their perspirations.

But if a disease be already produced by the exertion  
of heat which we sometimes see in this city, so as  
even to produce death, what is to be done? Perhaps  
one frequently affected in this manner. At the battle of  
Monmouth several British soldiers were found dead  
who had not the least mark of a wound. Their death  
was certainly owing to the excess of heat. This disease  
comes on with a faintness, a difficulty of breathing  
growing & increasing with great pain. He feels an im-  
position to walk therefore sits & is desirous to sit down.  
He falls down; his breathing is extremely laborious  
his mouth parched; his skin dry; It continues



half an hour, & if not soon relieved the patient dies <sup>by</sup>  
He may be relieved by simple remedies. Cold water is  
the best application. This will succeed even when applied  
to the hands or the feet by plunging them in; or by throwing  
it in large quantities upon the face & if from any height  
so much the better. The colder the water is the better.  
Frictions likewise should not be neglected. For these  
means many have been relieved, & they will succeed when  
applied to horses. Drivers or carters who use their  
horses with great inhumanity often pay for their cruelty  
by losing one or two in a season from the effects of heat.  
They often however recover them, especially within these  
few years, by the application of cold water. I once saw the  
effects of this, when a horse after falling down, from the  
violence of the heat, was recovered by throwing 20 or 30  
buckets of water upon him. I am not very certain whether  
very warm water acting as a stimulant might not  
have the same good effects as cold water. I only throw this out  
as a hint. I once heard of a gentleman, <sup>who</sup> in these circumstances  
was relieved by putting his feet in very warm water



68. We now return to speak of the third general  
effect of heat viz.

### 3 Of Evaporation.

Vapour is a light transparent substance similar  
to air, & is of considerable elasticity & is produced by  
rarefaction by heat, & condensation by cold. A striking  
instance of the power of vapour, is that one drop of  
confined in a small glass vessel & exposed to the fire will  
burst it with violence after some time. From these prop-  
ties vapour is most extensively useful in the arts.

One instance will suffice to illustrate this. The women  
in glass blow their spittle into it, which being converted  
into vapour expands & forms with their assistance with  
small exertion of their breath, the various glass vessels  
now used. From the effects of vapour the braziers are  
solicitous to keep water from their bras when in fusion.  
Vapour, like fluidity, depends <sup>entirely</sup> upon heat, as it returns  
to its natural state by abstracting the heat. The degree  
of heat necessary to produce vapour is greater than  
which is required for the production of fluidity. There



There is a difference in the vaporific point, some bodies <sup>69.</sup> requiring more heat than others to convert them into vapor. Hence proceed the terms fixed & volatile. These terms are entirely relative, as no body has been found out so fixed as to resist the vaporific power of heat.

As the pressure of the air has great influence on evaporation and as it is carried on much more rapidly in a rare than in a dense atmosphere it is necessary to have recourse to the air pump when the pressure is always the same accurately to determine the vaporific point of different bodies. In this water boils and evaporates at  $90^{\circ}$ . Spirit of wine evaporates and boils violently from the warmth of the hand. From a knowledge of the principles of evaporation we account for boiling. Some say that it is owing to water not containing more than a certain degree of heat; but this is not the case, as water when confined will contain more than  $212^{\circ}$  of heat. This is the case in Bopins digester when water may be made so hot as to melt lead &c according to Muschenbroeck. Bopins digester was first used by physicians to extract a rich soup from bones. This dish is now laid aside as it is not worth the trouble of preparing.



8 20. Thus have derived boiling from the expulsion of  
air. But the air would be soon dissipated. Why then  
should boiling continue as long as a drop of water remains?  
The true reason is that the liquid nearest in contact with  
the fire is rarefied or converted into vapour, hence ascends  
escapes in the form of bubbles, which rise on the surface  
of the water. That water is not so hot after as just before  
boiling is owing to the evaporation which then takes place.  
The connection that subsists between evaporation and  
generation of cold.

The vaporific point is so far from being the common  
degrees, that some have it below the point of fluidity: thus  
in some substances assume the form of vapour, before  
they become fluid, even in the common temperature of  
atmosphere; such for instance are camphor, volatile  
salt, arsenic &c. Zinc.

We shall now explain a few chemical terms.

Evaporation is when the volatile parts of a body arise  
leave the fixed behind as in the making of bay salt.

Distillation and Sublimation are the reverse of  
the former. Thus are instituted to preserve the volatile parts



When the product is fluid it is called Distillation. 75.

When it appears in a solid form we call it Sublimation. Products which arise are called Flowers or Sublimates according to their appearance.

Is heat capable of producing vapour in all bodies?

Cenths seem to be the only bodies in nature which resist the evaporating power of heat. Even gold the purest of metals which Mr. Boyle kept in fusion for two months & pronounced it capable of evaporation has been made to burn by the concentrated heat <sup>in the focus</sup> of a burning glass. We are unacquainted with the greatest degrees of heat that may take place. Let us therefore suppose that the resistance of the cenths is owing to the insufficiency of the means employed; Let us conclude that there are no bodies in nature that are proof against the evaporative power of fire.

The evaporation mentioned above which takes place in the common temperature of the atmosphere in some bodies as Camphor & Arsenic &c. is called spontaneous. The vapour produced by it possesses no elasticity & differs from that of water produced by heat. The greater the surface exposed the greater will be the evaporation. Thus, a wet sponge hung up in the air soon becomes



72. dry, by reason of the great extent of surface  
When the vapour is confined evaporation will take  
place only to a certain degree -

Vapour is always produced by heat, & when this is  
abstracted it is again condensed. From this we know  
for the drops of water that are frequently observed  
ling down the sides of such vessels as contain cold  
as the vapour contained in the atmosphere is cooled  
on the vessels by the coldness of the contained water.

This is illustrated by the condensation which takes  
place when we breathe on a bottle of cold water.

This is also observed on the windows of lead chimneys  
on cold dry mornings. Hence also the frost which  
is observed on houses & rocks in the midst of a thaw  
for the wind that brings the thaw is generally loaded  
with vapour, which meeting with the cold houses  
rocks is condensed. On the same principles we account

for the production of dew, rain, &c. The ground being  
warmed during the day by the sun sends up a quan-  
tity of water in the form of vapour. This vapour being  
in the evening by the cooling of the air returns to the  
earth in refreshing dews -



The rising of misty fogs from low marshy places 73.  
depends upon the same cause. The unwholesomeness of  
fogs is owing to their arising from putrid stagnant  
water. Hence we also see why vapours rise so copiously  
from a hole broken in the ice, from the heat of the water  
contained under it. Water in the same manner rising from  
rivers the ocean &c. forms clouds which when condensed  
descend in the form of rain or in gentle showers: when  
congealed in the air in the form of hail & snow: and after  
answering the purposes for which it was designed is poured  
back into the bosom of its parent ocean.

Spontaneous Evaporation has been accounted  
for in different ways.

M<sup>r</sup>. Derham & others say it arises from the air in the fluid  
being expelled by the heat & carrying with it some of the  
fluid in the form of bubbles - This argument is from water  
rising in the air pump, when the pressure of the atmosphere  
is taken off. But we know that the evaporation continues  
while drops of the fluid continue, & besides such bubbles  
could not be raised into the air.

Gravesend & Muschenbroeck say that it only requires



1/4. a smaller degree of the boiling heat to bring on  
 evaporation. But this cannot be the case, for then the  
 vapour would be elastic. But we know that spontaneous  
 vapour is perfectly inelastic. Some more probably of  
 that air acts as a solvent upon fluids, & thereby causes  
 to evaporate. In many respects there is a great analo-  
 gy between solution & evaporation. 1st Solution is  
 increased by heat. The same is the case with respect  
 to evaporation. Thus boiling water will dissolve  
 quantity of salt, which it cannot retain in solution  
 when cold. In like manner, by the accession of cold  
 vapour will be condensed & will recover its former  
 2. Solution is increased by increasing the surface  
 The same takes place in evaporation. 3. Agitation  
 quickens solution. This is also resumed in evaporation  
 which is much promoted by the agitation of the  
 But evaporation can be carried on in an exhausted  
 receiver quicker than out of it, & the more perfect  
 the air is exhausted the sooner will the body evaporate  
 Evaporation seems to be a diffusion of the  
 particles



particles of water in air. Windy weather appears to promote  
evaporation by dispersing the vapors collected over the  
water & thus giving opportunity for more to rise. Hence  
the roads that have been wet by preceding rains  
are dried much sooner in windy weather, than in  
a still state of the air.

It is now fully established that cold is always gen-  
erated by evaporation. This doctrine was first  
started by Mr. Haivorn & enlarged upon by Mr.  
Pickman of Petersburg. Dr. Cullen was the first  
who by many conclusive experiments fully as-  
certained the matter. Dr. Franklin has since enrich-  
ed with many practical observations. As this is a dis-  
covery of some importance in Chemistry & Medicine  
I would advise you to peruse Dr. Cullen's paper on this  
subject in the Physical Literary Essays of Edinburgh  
Vol 2. Page 145. We shall illustrate this truth of  
this by Dr. Cullen's own experiment. A thermometer  
dipped in spirit of wine & afterwards suspended in open  
air will cause the mercury to fall several degrees  
& it will continue so to do while the ball is wet with it.



76. When it begins to cry the mercury to return  
its former height cupped dipping with producing  
more remarkable sinking of it. The sinking of  
liquor in the tube would be hastened by blowing  
it, or by moving the thermometer nimbly to & fro  
the air. Dr. Cullen by the application of Spirit of  
resin the mercury sink from  $44^{\circ}$  to below the  
freezing point. With ether in vacuo it sink from  
 $50^{\circ}$  to  $20^{\circ}$ —

The cold produced by evaporation is of great  
importance in many places, in the warm eastern countries  
especially. Thus the inhabitants of India, China, Persia  
Egypt have cups composed of an earth so porous as to  
of a good deal of what they contain to transude. Then  
evaporation the contained liquor is effectually cooled.  
These cups they cover with a red cloth in honour of the  
Lunar. Mr. Rouelle had a cup of this kind which  
given to him by a Physician who lived 20 years  
these people. In Egypt whole towns are supported by the  
manufacture of these cups. Those who travel the  
deserts of Arabia suspend their liquors under the  
lullies



litters of their horses, or other beasts of burthen 77  
in vessels constructed on purpose in order to preserve  
them cool from the evaporation which the motion  
of the animal occasions. This is an excellent con-  
venience where springs & streams of water are scarce.  
The custom of cooling liquors by evaporation is not  
confined to the Eastern countries; but is practised in  
the Levant & in many parts of the W. Indies. They cool  
their wine by wrapping a wet cloth round the bottle  
containing it & then exposing it to a current of air.

That the evaporation may be quickened by carrying off  
the vapour already formed —

The cold is proportioned to the evaporation which  
takes place & again this is carried on more rapidly  
in a ~~vacuum~~ than in a dense medium. It is consequently  
more remarkable in an air pump. Other vapours  
so quickly in vacuo that a tea cup full of it placed in  
a bowl of water will be converted into vapour & freeze  
the water in a few minutes on the hottest day. From this  
we may be enabled to understand a fact mentioned by  
Dr. Ruysch in his Natural History of Aleppo,



80. That during the time the southern winds blow  
and extremely warm, the water that surrounds the place  
is cooler than at any other time. This must be owing to  
the heat promoting evaporation, the wind carrying off  
vapour as fast as it is formed. Hence we may always  
attend why low marshy grounds are cooler than  
dry lands; why the cultivation of a country  
rearing of grain renders a country warmer, as the  
moisture of the earth is absorbed by the plants and  
sent into their composition instead of instead of  
evaporation; why it is dangerous to sit in a  
room, and particularly if at the same time  
is a large fire in it, as this must increase  
evaporation: why sprinkling the floor with  
or water produces an agreeable cooling; and  
most weather especially if attended with cold is  
productive of febrile diseases. A more curious  
phenomenon than either of these is, that, tho the  
the human body in all climates & in all  
series is invariably between  $96^{\circ}$  &  $100^{\circ}$ . Yet that  
of many climates where inhabitants enjoy



very good health, very considerably exceeds them 79  
degrees. Dr. Linnæus of Charleston S. Carolina, tells us  
in the Philosophical Transactions, that he often observed  
the mercury stand at 126°. and Dr. Keare in  
his practice of Physic informs us that in Syria the  
mercury frequently stood at 144°. and that the inter-  
mittents not only lived but enjoyed good health. The  
heat then must have been carried off by perspiration &  
sweat, as the discharge from the surface by these means  
is always proportioned to the degree of heat; & the cold  
produced by evaporation is always proportioned to the  
perspiration. Hence the vapors in the most intense heats  
of summer suffer less when they sweat most profusely.

We are next to treat of the fourth general  
effect of heat viz

4. Of Ignition.

This effect of heat is more universal & is produced  
with more uniformity than the three others - It is then  
seen at all times, in all bodies, in all places. All  
bodies that emit light & heat & appear luminous



80. on their surface are said to be ignited. All bodies  
 when ignited contain equal degrees of heat. This is  
 difficult to determine when ignition begins, as sub-  
 stances will appear ignited sooner to those who see acutely  
 than to those persons whose organs of vision are weak.  
 Therefore opinions on this subject will be different.  
 Dr. Martin supposes that red hot iron contains more  
 heat than burning wood; but this is false. Iron  
 may be rendered hotter even after ignition. Accord-  
 ing to Sir Isaac Newton whose calculations  
 may be depended upon) is ignited at  $635^{\circ}$  but  
 will admit of a still greater degree of heat to  $1044^{\circ}$   
 Mercury takes upwards of  $600^{\circ}$  to make it boil. The  
 boiling point of mercury is nearly the same as  
 in which it is ignited. This confirms the truth of Boerhaave's  
 observation as we know that the point at which all  
 bodies ignite is nearly the same. Boerhaave  
 asserted that metals will not become any hotter after  
 melting. This he inferred from an assumed analogy of fluids.  
 But this is not the case. There is no body of  
 nature but may be rendered red hot, or become ignited.



ignited if the vapour be confined or prevented from <sup>escaping</sup>. Even water may be ignited with a sufficient degree of heat if the vapour is confined. Water in Baskins digester may be made so hot as to melt lead & tin which is but a few degrees from the point at which iron ignites. The vapour of iron when immixed into a red hot furnace appears of a bluish colour which is owing to its being there ignited —

Having thus considered the General Effects of Heat before we enter upon those of Mixtures we shall say some thing of

## Inflammation.

Inflammation is confined to one class of bodies which are from thence called inflammables. The effects of heat on these bodies differ from those on other bodies in the following particulars.

1. Inflamable bodies suffer change or diminution of weight.
2. Inflammation is produced in some bodies from slight causes.
3. Bodies when inflamed emit light & heat during inflammation.
4. All bodies after inflammation receive some increment.



82 document which is inflammable. I do not  
have except spirit of wine which was called the  
petroleum ignis by Boerhaave or sulphur. If  
wine be burned under a bell a considerable quantity  
of water will be collected. Sulphur may be collected in  
a different form after burning in nearly as great  
a quantity as before inflammation.  
5 The presence of air necessary to produce & continue  
inflammation. It will be carried on according to the  
purity & density of the air; hence it is greatest in cold  
weather. Air-seeds flame only to a certain degree.  
Simply fresh air is sufficient inflammation is main-  
tained on. Some have supposed that air seeding flame  
to a certain degree only is owing to its becoming  
surcharged with vapours from the inflamed body.  
But this is not the case. Many vapours rather speedily  
extinguish flame. Sir Isaac Newton found that  
the nitrous acid to produce flame when mixed with  
inflammable bodies supposed it to be owing to the  
nitrous acid in the air. But no nitrous acid  
exists in the air, and it would be necessary that  
there should be a vast quantity as some have supposed.



at the same time. It appears to be owing to a 83  
combination of the Principle of Inflammability  
or Phlogiston with common or atmospheric air  
producing fixed, or phlogisticated air —

Air then supports and feeds flame. The conical form  
irregular manner in which flame ascends is owing  
to the action of the air. It comes with it a substance  
which we call soot. This is a combination of  $\phi$  with  
a small quantity of some portion of the inflammable  
body & a small quantity of volatile salt. That is certainly  
 $\phi$  is evident from its taking fire so readily. Soot is  
produced in largest quantity when the inflammation  
is most rapid —

The principle of inflammability is never destroyed, but  
always exists under some new form. As the same is at  
times & may be communicated to bodies which have lost  
it from thus containing it which have not the least resem-  
blance. Thus by adding charcoal to the vitriolic acid  
sulphur will be formed, & the same thing takes place  
if we add any other substance containing  $\phi$ . This  
principle is called by Macquer & other Chemists



84. Chemists Phlogiston. but I choose with Dr. H. to call it the principle of Inflammability. By the Principle of Inflammability (~~is~~) we mean that principle which produces flame or is the cause of inflammation when combined with other bodies; tho' not inflammable or capable of inflammation by itself in a separate state.

You have now seen the general effects of heat on the objects of Chemistry. We might here make some observations on its astonishing powers.

It is the grand principle of activity in the universe. The most solid bodies are expanded by heat. This expansive power is so great that to it some philosophers have ascribed the swelling of the earth at the equator. The ascent of vapour & all the melting of hail, rain &c. are produced by heat. The flame which so comfortably warms us in winter & is so useful in our kitchens & laboratories is occasioned by heat. It is the source of life in plants & animals. When heat is withdrawn from their bodies & the beautiful vegetable nature fades. Upon the return of it they again revive & flourish.



85  
in their original splendor. Animals also owe their  
existence to heat. Thus, beets, weasels &c. lie in a  
torpid state during winter. But when they feel the re-  
generating beams of the sun are again called forth to life  
action. It not only recalls life when about to depart  
from its possessor; but also in some cases gives it the spring.  
Thus in the penitration of eggs, where a heat of 96° is con-  
tinued for a proper length of time a perfect animal is  
produced. How wonderful are the operations of heat!  
How wisely are they regulated by the succession of day & night  
of winter & summer! We cannot here sufficiently admire the  
goodness of the great Creator in preserving the order of the  
universe! Should the laws of gravity be suspended  
the earth forget to revolve in her orbit, how terrible  
would be the consequences! Should she withdraw  
herself but for a moment from the sun all nature  
would be locked in chains. Water that the unity of the  
universe would cease to flow. It would forget to rise in  
vapour & beautifully to distill upon the earth in re-  
freshing showers. Plants would die & itself in  
animals



86. animals would soon be extinguished. In a  
the air and every other fluid would become a dense  
solid mass. On the other hand, the effects would be equal-  
dreadful, were the earth to approach too near the sun.  
The air would lose its elastic force, rivers would overflow  
their banks; the parched earth would refuse to affor-  
nourishment to plants and animals; all nature  
would resume its primitive chaos.

### Of Mixture.

The effects of mixture are more confused than those of fire  
but it is the second active principle in nature. The mixture  
it is difficult to point out conflagration in nature  
forward without discovering mixture.

By mixture we understand the union of dissimilar bodies.  
This is very various in nature & its appearances. Some  
bodies unite homogeneously; some but for a short time  
some produce heat; some cold; some unite with  
insensibility producing effervescence; some unite  
silently. Of these we shall give an instance  
1. Salt water unite homogeneously & intimately



2 Water & oil unite only for a short time: the  
water soon subsides & the oil floats on the top 3 Vitri-  
olic acid and water generate heat  $10^{\circ}$  or  $15^{\circ}$ . 4 Nitre  
& water produce cold;  $10^{\circ}$  or  $12^{\circ}$ . 5 Sp. Sal ammoniac  
& any of the acids rush together with violence & impetu-  
osity, & an effervescence takes place, Matis, Maysindorth  
sums. This is owing to the extrication of fixed air.

Ebullition & Fermentation as distinguished from Effu-  
rescence, The former is produced by the boiling of fluids;  
the latter is a gradual tendency towards an assimilation  
of different bodies with little noise & small separation  
of air 6. Camphor & Spirit of wine unite slowly  
& intimately without any sensible motion. —

Mixture is divided into Chemical Mixture  
Solution and Diffusion.

## 1. Of Chemical Mixture —

Chemical mixture is a union of a menstruum  
and a solute as of Sp. Sal. ammo. & Vitriolic acid.

The following circumstances are necessary to constitute  
chemical mixture. 1. That the bodies after mixture  
possess none of the properties they had separately. test.



80. but form a tertium quid. 2.<sup>o</sup> That there is a generation of heat. This invariably accompanies. 3. Only two bodies can be united at one time. 4. Bodies which were before volatile become more fixed by mixture. These marks of Chemical mixture are not unexceptional but if taken together seldom fail of characterising it.

### Of Solution.

Solution is when one body is so intimately united or suspended in another that they appear homogeneous. The body to be dissolved is called the Solute that which dissolves it, the Solvent or Menstruum.

The last term arises from the notion of the eminent who in most cases allowed a month for the solution imagining that it required that space of time for the matter to be dissolved. Solution differs from Chemical mixture in the following particulars.

1 In Solution there is no change of property. Thus a solution of salt dissolved in water is salt still, tho it is reduced to an infinite number of minute particles, & may be again recovered in its former state. 2 It is not attended with a generation of heat, but always of cold e.g. Nitro



Nitre dissolved in water produces cold.

89.

3. In solution more than two bodies can be united:

thus we may dissolve nitre in the same water in which common salt is held in solution. It will nevertheless remain homogeneous. After a fluid has become saturated with one body we may add another which will also be taken up. The fluid will be now enabled to suspend more of the first. Thus after water has dissolved as much common salt as it is capable of containing in solution, we may dissolve in it a quantity of nitre & it will then dissolve a fresh portion of common salt.

This appears to be owing to the introduction of a quantity of water in the nitre

Solution has received various appellations according to the manner in which it is performed.

1 Maceration is when the virtue of the solid is extracted by a heat below that of boiling water.

2 Infusion is when the fluid at the boiling point is poured on the solid & suffered to remain on it till cold.

3 Decoction is the continued heat of application of the boiling heat to the substance whose virtues we wish to extract



80. 4. Digestion is when a fluid above or below  
the boiling point is continually applied to the  
point selected; but it is more properly turned so when  
carried on in close vessels and above the boiling point.

5 Circulation is, when the vapour that arises  
condensed, is returned again to the vessel in a liquid  
form, to act upon the body.

6 Deliquescence is, when a body is exposed to  
exposure to the air, which we know contains a portion  
of water always in it, even in the hottest climates.  
Al. Tartari per deliquium is prepared in this manner.

7 Amalgamation is the dissolution of mercury  
in mercury.

In Solution the following circumstances influence  
the operation. 1. Bodies dissolve quicker in proportion  
to their surfaces. Thus metals may be dissolved quicker  
in an acid pulverised Metals by being beaten into  
2 Solution is quickened by agitation, by which a greater  
proportion of the menstruum is applied to the substance.  
Thus Spirit of Wine poured gently upon water will  
on the surface without any appearance of union.



union. But on state of the spirit with so 91  
intimately unite them together that they will remain  
for many years.

3 Solution is quickened by heat, more of the  
silver will be taken up. Thus water which dissolves 6  
parts weight of nitre when cold will dissolve a much  
greater quantity of it when heated. How great the  
power of heat is in increasing solution may be und-  
erstood from what is said formerly of Papin's Digester

4 Solution is assisted by the contact of air. Air is so  
necessary to solution that some have imagined that all  
bodies owe their fluidity to its presence. If Copper & Sp.  
Sal. ammoniac are kept excluded from the air they  
have no effect on each other, but the moment the air  
comes in contact with them they act on each other.

The action of air in solution is further evident in this  
that if any corrosive substance be kept in copper vessels  
they will be only affected when the two come in contact  
with the air, at the surface. If water saturated with nitre  
be put under an exhausted receiver the nitre will im-  
mediately fall to the bottom.

Of Diffusion.



8  
92. Diffusion is sometimes called mechanical  
to distinguish it from the true solution we have been  
speaking of. Diffusion is distinguished from Solution  
1. In having a turbid appearance. 2. In not being per-  
manent 3. In depending entirely upon agitation. Thus  
iron united with water is said to be diffused in it. By rest the  
iron subsides. The red particles of the blood are diffused in  
the serum & coagulated by rest in an blood vessel, and  
proved by microscope. Spontaneous separation which  
takes place after blood clotting. It is I guess improper  
to be properly acquainted with their turns, as nothing  
more the wants of medical knowledge than an acquaintance  
of them.

## Of Decomposition

Decomposition consists in the separation & diminution  
the constituent parts of bodies. It is performed by Precipitation  
Crystallization and Evaporation.

## Of Precipitation.

Precipitation is when to a solution of a body in any  
medium another substance is added which has a greater  
attraction for either of the substances than they have



have for each other, with which it will combine. The <sup>93</sup>  
first body will be separated. The body here added is called the  
Precipitant. There are four different ways of Precipitation.

1. Of the dissolved body alone. i.e. when the precipitant unites  
with the menstruum & the dissolved body falls to the bottom;  
as if to the solution of marble to the vitric acid or if added  
some alkaline salt; it will immediately unite with the  
acid, while the marble falls to the bottom in the form of  
powder. 2. Of the dissolved body & precipitant. i.e. when  
the precipitant is attracted more strongly by the solvent  
than by the menstruum. Together with it falls to the bottom.

Thus by adding to a solution of marble in the vitric  
acid a little vitric acid the marble











96.



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90.



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1.  
Notes taken from a Course of  
Lectures  
on the Practice of Physic  
delivered by Benjamin Rush M.D.  
Professor of Chemistry and Practice  
of Physic in the  
University of Pennsylvania  
November 1. 1790







That branch, which treats of the cause & cure of diseases, is called the Practice of Physic. A disease is that state of the body, in which the functions are performed with difficulty, or irregularity. Diseases are varied in different countries, and in different ages.

Causes are divided into remote, predisposing, occasional, and proximate. To illustrate this, Cold or Contagion may be the remote cause of Rheumatism, Plethora a predisposing cause of Hemiplegia, while violent exercise may be the occasional. Spasm is the proximate cause of Palsy. The remote cause of Gout is intemperance; the predisposing or hereditary disposition; the occasional may be either taking an extraordinary quantity of wine, or a strain in the ankle, & its proximate spasm.

A Symptom is, an apparent deviation from health & obvious to our senses; it must be apparent, or it cannot be a symptom.

Symptoms are divided into three sorts; 1<sup>st</sup> Symptomata morbi; 2<sup>d</sup> Symptomata causa morbi; 3<sup>d</sup> Symptomata Symptomatum. Thus in Pleurisy, for example, the pain, fever, & cough are the true symptomata morbi; but if Cory or Angina attend, it does not belong to  
to



4 to the Proximate, but the remote cause, and therefore  
the Symptoma causae mortis; the difficulty of breathing  
is a Symptoma Symptomatis. Diagnostic Signs  
These symptoms, when taken collectively, constitute  
the distinction of a disease, & are called Diagnostic  
Prognostic is a declaration of the issue of a disease  
taken from the state & degree of the symptoms.

In acute diseases, the Prognostic should always  
be reserved & evasive. It is always difficult in chronic  
diseases. Physicians should speak with caution in  
diseases; in chronic, with more certainty & boldness.

The Diagnostic in acute diseases is drawn  
1<sup>st</sup> from the Pulse 2<sup>d</sup> the urine, 3<sup>d</sup> the sweats, 4<sup>th</sup> the  
5<sup>th</sup> the countenance, & 6<sup>th</sup> the aculeitus. In chronic  
diseases they should be drawn from the Animal  
functions, and chiefly from the appetite. But all these  
are difficulties, even the pulse is not to be depended upon  
in all cases. There is not a symptom declared to be  
by Hippocrates & Aetius from which I have not seen  
patients recover; few of those which are called



5  
salutary, after the appearance of which I have not seen  
them die. And in chronic diseases the more we can  
avoid a Prognostic, the better. The friends of a patient will  
be anxious to know your opinion; the answer commonly  
made is, I have seen persons who appeared to be much  
worse recover, & some, who seemed not so ill, have died.  
An old woman has sometimes slipped in & cured diseases,  
which Physicians have pronounced incurable, to the  
disgrace of Physic & its Professors. Never then give up a patient  
ever, never pronounce him incurable, it is equal to pronoun-  
cing the sentence of death on him. We should always  
endeavour to keep hope in view, however small that hope  
may be; for we do not know all the resources of nature,  
nor what powers she still may have. A patient after recov-  
ering after the Physician has pronounced him incurable,  
ought to come under the cognizance of the Civil  
Magistrate, & the Physician declared incapacitated for  
his business, & excluded from practice. We should smooth  
the path of death by every means in our power; for it is  
natural to have an aversion to dying.

Diseases are either Idiopathic or Symptomatic.  
The Idiopathic are <sup>sub</sup>divided into Natural & Artificial.



6. The natural one chiefly Fevers. In Typhoid time, out of 100000 Septent who died 6000 were affected with fevers; but not more than 1000 of 100'000 are of Fevers, at present, as the bills of mortality testify. Fevers, Old age, Casualties from Wounds, Accidents seemed to be the only outlets of life. Artificial diseases seem to be the spring of Civilization, even the learned professions, & some mechanical improvements, as well as Intemperance, are subject to the Artificial diseases -

Indications of cure are founded on a knowledge of the Proximate Cause, especially thus in curing a fever. The first thing to be done is to remove the proximate Cause. Remedies are the means employed for the removal of diseases.

What are the powers of nature in the cure of disease by nature understood in the present case, Physical Diseases all performed by the same powers that govern Electricity, Gravity, or Magnetism. A ship, when thrown on her side, recovers her former situation by virtue of



her particular structure; but if the ship takes fire  
it is consumed, the fault certainly cannot be laid on the  
Builder. In like manner the Author of Nature has  
employed, in our bodies certain powers, suited to obviate  
all the natural diseases; but when the body is attacked  
by the artificial, it resembles an Indian fighting against  
a man equipped with six arms =

### History of the operations of Nature.

1. There are cases in which Nature is still successful,  
as in Fevers, for here she diminishes our appetites,  
& makes us seek for cold air & cold roasts. In Hemorrhages  
she forms a coagulum.

2 There are cases, in which nature is deficient  
in her operations, as in Putrid & venous Fevers.

3 Sometimes the power is overproportioned to the  
disease, as in Catarrhia Pilon.

4 Failure, as in atonic Gout, Epilepsy, Coma, Mercurial  
venereal disease & Tetanus.

What does nature do in these cases? Nothing.

5 She does mischief as in the Dropsy & consumption



8. Consumption; the Mucus Pectoris on the brain  
various the Melancholic to solitudo. There are  
cases in which the seeds no harm to us from  
and inconveniences, as shown in the Plethora  
Chronic Inflammation, as discussed by Dr. Keene.  
When the harm is not proportioned to the damage  
as in the Tetanus & Hydrocephalus. A Lunatic  
as well plead against the sequestration of his wife  
because he had sometimes lived in  
pretends to clear himself of their charges. But this is  
further confirmed by desiring the remedies, the  
of which seem continued, to remove, assist, restrain &  
and her operations. Some truths, like strong liquors,  
require a strong head to digest them; of this kind  
is the least advanced.

Diseases are divided by different authors  
in different manners. The Zoologists, Sauvage, Linnæus  
Vogel, & Linnæus have been complicated by Dr. Cullen.  
From committing Cullen's definitions to memory  
as much advantage will be derived, as getting  
German rules in learning Latin, or getting some of the



9

The first Propositions of Euclid in learning the  
Mathematics. Let me advise you never to prescribe  
until you have investigated the disease, & fix it to its  
proper class, order, genus, & species. In all diseases particu-  
larly Fevers the pulse is considered as a good Criterion  
by which we may judge. I shall offer some observations  
on the manner of affecting it. 1<sup>st</sup> The different positions  
of the body influence the pulse; it is fullest when stand-  
ing, slower when sitting, still slower when lying,  
slowest when lying on the back; a moderate meal  
heat of fire, walking &c. will quicken the pulse.  
Different positions of the hand & arm influence the  
pulse. The hand should be in a prone position to feel  
the pulse to the greatest advantage. It is a good  
method to sit down by the side of the patient to feel the pulse  
for our sensations are influenced by the positions of our bodies, for  
the same reason that a sick person is altered. If we feel the  
pulse standing, every subsequent time we should also stand;  
if sitting, then the next time we should feel it sitting. We  
cannot gratify two senses at once. I heard a French man say  
while at dinner to some person who was talking very loud  
don't talk so loud I cannot taste my vicuals. There is some  
sense



10. now in this, for if we wish to apply all our sensations, only  
on subject, all of them should be concentrated on it. Shutting  
our eyes is a good method of abstracting our attention from  
external objects, when we feel the pulse.

2<sup>d</sup> The pulse should be felt in both wrists, unless the patient  
lies on his back. It is a good way to run your hand into  
the armpit if there, if convenient, to prevent all motion  
in his body & limbs, if possible. This will not be deemed  
ment, when we consider that our own reputation, & that  
of the patient, depend upon the greatest accuracy in the matter.  
The artery sometimes takes a preternatural course; that is not  
of the common direction, it takes one between the back of the  
thumb & the forefinger across the wrist.

3<sup>d</sup> Passions of the mind influence the pulse very considerably,  
chiefly with respect to its velocity, & not much, as to its quantity.  
Hence we should not approach to a patient too immediately  
for the first appearance of a Physician influences the passion  
of the patient's mind very considerably; he is anxious to know  
what is his disease, what his danger, how long he is to live, &c.  
He is influenced by the apprehension of bleeding. A woman  
who had never been bled, was affected with an Hepatitis; upon



calling with a view of drawing some blood, her countenance  
became pale, she felt violently agitated, & scarcely a trace  
of a vein could be seen. The bleeding could not be per-  
formed, & she died of an Impostume in her Liver.

## Pyre xia. See Cullen's

Order I. Febres. In considering of Fevers the  
first enquiry to be made is concerning the Proximate Cause.  
For this refer you to Dr. Cullen, who has divided the Febr into  
three stages Viz. the Cold, the Hot, & the Sweating -  
Spasm & Reaction constitute the Proximate Cause  
of Fever. The cold & spasm are of a stimulating nature.  
When remarkable debility prevails, the Nervous or Putrid  
Fever called Typhus is the consequence; but when there  
is a great reaction, the Fever is of a very opposite nature, & viz  
the Inflammatory or Sympthema.

Fevers affect the arteries, nerves, & fluids. The arteries  
are stimulants, the nerves as secretaries, & the fluids as septics -  
In inflammation alone the arteries are affected. There  
are inflammations which affect the nervous system  
only; & there are those which affect the fluids & nerves  
both



1<sup>st</sup> both as in Typhus; then those which affect all thro, as  
in the Synochus, of Cullen. Fevers will be continued  
when there with is great debility or obstinate spasm  
there is no continued fever, in which one of these does  
not obtain. The intermediate degree constitutes the  
Intermittent Fever.

The Remote Causes of Fevers are chiefly  
Marsh, and Humen Effluvia; then other causes  
to be enumerated hereafter.

Marsh Effluvia, however. the general affec-  
tion of Miasmata. Humen Effluvia are called contagia  
of which there are various kinds.

1<sup>st</sup> There are certain species of Contagions peculiar to the  
species.

2<sup>d</sup> There are Contagions that are peculiar to particular  
animals, and do not affect men, or other animals. Those  
which affect cows do not affect horses. Most of the diseases  
which affect brutes are of the Catarrhus kind. As for  
speculiar to horses, in this country, & commonly called  
is the Blind Staggers, supposed to be only an higher degree  
of Catarrh; for some men are affected with staggering



and even comes in very violent ~~fall~~ attacks of Catarrh. 13.

3. It is peculiar to certain descriptions of men, Thus Negroes of the West Indies were exempted from the Yellow Fever that raged there. In Virginia, an Epidemic appeared, which affected the Negroes only. This fact extends to the Indians and white people at Nantuckete & Martha's vineyard, where some Indians were

Epidemics sometimes made their appearance amongst those which did not affect the white, & the white inhabitants were sometimes seized with Epidemics, & the Indians escaped.

4. Peculiar to certain ages of the human species, Catarrhs which affect children only; sometimes have the same effect on grown persons only. Then Epidemics which affect children only of particular ages, & some which affect all.

5. Miasmata are produced only by heat & moisture. When ponds or rivers are perfectly full of water, no insensible exhalation can take place. There is no sickness during the overflowing of the river Nile in Egypt, nor will moisture produce Epidemics unless when the marshes are overflowed in April & September, no diseases ever produced.



14 6<sup>th</sup> Marsh Miasmata exert their effects in consequence of cutting down trees, & damming up water. Clearing a country tends to make it sickly. Cultivating a country tends to make it ~~to~~ healthy. Hence in Pennsylvania intermittent fevers increase, & in some of the eastern states, there is scarce an intermittent to be found.

How are the effects of Miasmata to be destroyed?  
1<sup>st</sup> They are destroyed by fire, whether the contagious matter be little animalcula or not, is not well determined. Farmers should renew the brush of their fields to burn in September. Should choose a time when the wind is directly on the fire. Fires also within doors tend to prevent these miasmata from taking effect.

2<sup>d</sup> By surrounding the house with trees, which imbibe unwholesome air, but should not be planted too near the house or each other.

3<sup>d</sup> Sulphur Gun-powder with constituents preserved by mixtures to destroy the effects of miasmata. Vinegar by mixtures conspires to correct this impure air. Doct. Priestly recommends pouring vitruolic acid or common salt, which the Vitruolic acid decomposes & its ac-



acidities off in vapours.

15

5<sup>th</sup> Fresh air alone alt is useful, hence Epidemics are produced much less in summer, than in winter, because you can keep your doors & windows open, & have a free communication with the external air.

Fewers from contagion Amiasmata are less frequent than formerly. To what is this owing?  
1<sup>o</sup> To the increase of agriculture. 2<sup>o</sup> To the increase of horticulture. Hence a greater quantity of vegetables are used than formerly. Too great a proportion of animal food contributes to the production of Putrid Fevers. 3<sup>o</sup> More cleanliness, regard being now paid to it that used not formerly, particularly in goals. Mr. Howard says 1, that the Goal Fever has been never known in any part of the world, but in the British dominions, owing to more animal food being consumed there, than in any part of the world. 2<sup>o</sup> While washing the walls contributes very much to prevent the generation & production of the goal fever. Hence it is a query, whether hapud rooms be wholesome? 3<sup>o</sup> The use of sugar. It is remarkable that the plague never appeared where there was much



16 much sugar consumed. 4<sup>th</sup> More wine & small liquors  
both of which are antiseptic, & tend to preserve the body  
against Putrid Fevers. 5<sup>th</sup> More knowledge & care as  
the methods of preserving meats. The latter the more  
the more wholesome. Animals are now eaten far  
more sparingly, & also more attention is paid to the  
manner of salting it. Salted meat is an antiseptic  
hence children in the country are not subject to the  
diseases that are prevalent in cities. It is remarkable  
to the southward, that those who eat most salted meat  
are least subject to Fevers, especially if they take a mod-  
erate quantity of vegetables with their meat.

While Epidemic Fevers have diminished  
Europe they have increased in Pennsylvania, owing  
to the increase of still ponds & clearing more ground  
than is cultivated. The unequal quantity of  
rain some years past has been a cause also of  
epidemic diseases. There are two enemies to mias-  
mata & contagion viz. frost & heavy rains. Frost  
miasmata & contagion, cold & heat are remote  
causes. They cooperate with their causes. Cold & heat



prevents the propagation of contagion. A Person, if  
he is warm, may go into a room without danger of con-  
tagion, but if he goes into it when cold, the cold debilitates  
him, & he is of consequence more liable to be affected. The  
deaths of Armies are adventitious, owing to ignorance  
& inattention, as the life of a soldier in itself is a very healthy  
one.

Prognosis. This leads us to speak of critical  
days. We must consider first the Intermittent Fever, it is the  
natural type of continued fevers. The critical days are  
the 3.<sup>d</sup> 5.<sup>th</sup> 7.<sup>th</sup> 9.<sup>th</sup> 11.<sup>th</sup> here the tertian type ends. In  
the Quotidian type, there is greater debility, now the days  
change to the Quotidian Period. 11.<sup>th</sup> 13.<sup>th</sup> 15.<sup>th</sup> 17.<sup>th</sup> 19.<sup>th</sup> 21.<sup>th</sup>  
A more solid nature to deserve these days, on which we  
give the most active & powerful remedies. Hence  
Pelisters & Emetics ought to be given on these days.  
Purging ought to be given in greater quantity on  
these days 11.<sup>th</sup> & 13.<sup>th</sup> day. If purgatives given half an hour  
before the accession of the fit of an Intermittent, will be of  
more service than if given the day before. Doct. Cullen  
has given you the sign of death or recovery, in the vital  
animal



10 Animal, or neural functions of the body. The  
Prognosis is drawn; 1. from the aculeities. There  
much to be learned from the posture of the patient.  
The nearer he lies to his natural position, the better.  
If he lies on his side ~~there~~, there is not so much to be  
if he has lain on his back for some time, & is found on  
side, we may pronounce him better. Lying on the back  
is bad, with the mouth open is worse; & with the legs  
is still worse.

2. From the eye a great deal may be learned.  
The nearer it is to the natural state the better. An in-  
-cessant flow of tears is bad; a glassy appearance is also  
bad sign. This glassy appearance is owing to the patient  
winking. These are bad but not always fatal signs. Fal-  
sion is a bad sign; as also is picking at the bad cloth.  
Sleeping with the eyes open, turning up the whites  
them is a very alarming symptom.

3. From the countenance a good deal may be learned.  
It is a bad sign for a man to look suddenly old, facies hypoch-  
-ca. It is a bad sign for one to resemble his ancestors in a  
disease. Their resembling their ancestors arises from



This, that the bones of families are much alike, When 19.  
the countenance falls, the shape of the bones becomes  
more conspicuous.

4<sup>th</sup> The tongue affords a good mark to judge from.  
A white tongue is a sign of a fever; a dark one is a worse  
sign; a dry tongue still worse; A putrid dry tongue worst  
of all. The tongue may become dry from sleeping with the  
mouth open, hence you should always have this in your  
memory, when you examine the state of the tongue. This  
dryness generally begins on the middle of the tongue,  
and is an approaching crisis. The tongue grows moist  
first round the edges, which moisture gradually approaches  
the middle. It is of consequence to inspect the tongue.  
A circumstance with regard to the dark colour of the tongue  
is, that it will continue many days after a crisis, especia-  
lly in bilious fevers. Some aliments have the property of  
imparting this colour to the tongue. —

5<sup>th</sup> Sweats. They seldom relieve, unless they are mi-  
nimal over the whole body. They seldom relieve unless  
they continue 24 hours. Morgagni mentions a particular  
fever, in which, death, preceded by sweats, that never



20. were universal, & continued 24 & sometimes 36 hours, succeeded.

Wine. This is so various in its consistence and colour, and so easily altered by various circumstances, that Physicians should be cautious how they form their Prognosis from it. Turbid wine is supposed to indicate a crisis, & wine more certainly; & lastly the sediment is thought the most certain sign of it. Pale wine is supposed to indicate the presence of Typhus; red wine the Inflammatory & Septic disorders: However little is to be learned from the wine, because there are many symptoms more unequivocal & certain.

4.<sup>th</sup> The Stools, have been attended to in order to form a Prognosis but it is of little consequence to the facts, as you may get all the necessary information from the patient. Feces paene colorata indicate Green stools indicate an acid, dark brown the presence of bile. Stools formed into Cylinders are signs of some irritation. A quick discharge, as soon as inflammation takes place in fever, is a sign of debility, & commonly a fatal symptom. Involuntary stools indicate great weakness in fevers also.



36. A discharge of wind, accompanied with deorspitus, is 2<sup>d</sup>.  
a favourable sign, particularly after an involuntary discharge  
of Feces. Diarrhoea is a favourable sign in fever.

8<sup>th</sup>. An abscess in any part of the body is a favourable  
sign.

9<sup>th</sup>. Blisters after healing up, suddenly break out &  
looking red is a favourable symptom, & a proof that reaction  
has taken place.

10<sup>th</sup>. The voice, the more it depends from the natural  
tone the voice; when it is natural depends upon it  
not much danger is to be apprehended. When patients  
speak with a drawl it is favourable.

11<sup>th</sup>. Scurtus or Hawking & spitting is a favourable symptom.  
It occurs in acrimonial fever in the small pox.

12<sup>th</sup>. The pulse affords the best Prognosis, a strong pulse  
depends on the strength of the contraction of the heart, a full  
one on the large quantity of blood thrown out, a small  
one on a small quantity thrown into the arteries.  
A frequent pulse, on the frequent contractions of the heart  
a slow one on the slowness of them. The heave, soft, redoubled  
jerking pulse depends upon the motion of the arteries  
also.



22. A quick one on the irritability of the arteries; when the pulse is 140 times in a minute, it is thought a sign of death.

There is a peculiar softness, roundness & fulness of the face that indicates an approaching crisis, which old physicians knew as well as the hours on the face of a clock. It may be possible to graduate the pulse, make it its highest degree of irritation 10, & when you have reduced it, a complete solution of the disease will happen.

13.<sup>th</sup> The Intellects intimate the state of the disease. The state of the temper is worth attention, even the nurse will tell you that a patient is recovering, if he becomes irascible. The return of convulsions late in a fever is a deadly symptom. The return of taste after it has been absent, is a favourable sign, such as for coffee, & wine & small for snuff.

The return of appetite for animal food, & the return of sleep afford an agreeable Prognosis. There is no one of all these symptoms infallible, but it is generally preceded by an abatement of the symptoms on the critical day, preceding that on which it is to terminate. Some fevers wear away, as it were, without any



my crisis. Winteringham says that Epidemics often 23.  
terminate without any sensible evacuation. —

Indications of cure in Fevers are 1<sup>st</sup> to  
moderate the violence of reaction. 2<sup>d</sup> remove the cause  
of debility, 3<sup>d</sup> derivate the tendency to putrefaction. We  
shall begin first with Inflammatory Fevers. This thought  
there is no case of Synocha, in which a Congestion does  
not take place. In Intermittents the first genus is the  
tertium divided into those which have an Intermittion  
Permittion. — Persons in southern climates are generally  
attacked with Intermittent Fevers. The longer the cold  
fit continues, the more certain you may expect an  
Intermittent. Those fevers which make their appearance  
without a chill are generally continued; the circumstance  
by which you may know Intermittent Fevers, is puking  
of bile; but this bile is not the cause of the disease.  
A tertium comes ante meridiem, Taking all these  
circumstances together, you will not be at a loss to distin-  
guish between them.

In treating an Intermittent two things are to  
be considered 1<sup>st</sup> to conduct the Paroxysm (1)  
Paroxysm, is a fit, the periodical or lurches  
a fit



24 2. To prevent its recurrence. Paroxysms of inter-  
mittent are accompanied with great pains in the  
bones of the extremities, back, & head. The patient  
cold chills are very disagreeable; even death is  
on by Apoplexy, sometimes by vomiting, & sometimes  
by the violence of the chilly fit, which admits of  
Evacuation. When it is painful, & more is produced  
its being fatal, tis of consequence to endeavour  
cure it as soon as possible.

Remedies are, Liquid Laudanum, for  
alleviating the violence of a Paroxysm of the intermittent  
Dr. Boerhaave in his diseases of St. Lucia recommends  
this practice. The laudanum should be given in a  
large or quantity as in a fit of the Cholera. Where  
it is safe to give wine, you may with propriety give  
Laudanum. In intermittent fevers wine is necessary  
for how there is no congestion. As a sickening  
Peppermint tea, or hot punch, which last is to be  
well be of service, in taking which, the patient  
should be in bed & kept warm. To prevent its



return, the Indications are 1. To strengthen the  
tone of the system by riding just before the accession  
of the fit, which often prevents its coming on tho' seldom  
cures it radically. 2. Cold Bath during the inter-  
mission; it acts as a tonic, or by exciting horror. Amer-  
set his chimney on fire accidentally, just before a fit  
was expected; the horror occasioned by this, cured him  
notwithstanding his disease had resisted all the usual  
remedies. 3. Hot drinks have sometimes prevented their  
return, taken one or two hours before the accession.  
The country people place a patient before a fire, & make  
him drink hot today; tis an unsafe remedy, & ought  
never to be practiced. 4. Vomits. We usually begin  
the cure by vomits, but the practice is carried too far.  
If the patient vomits during the colic fit, when  
the disease happens in the spring, emetics are unneces-  
sary, but there are other cases in which vomiting may  
be improper. Viz. 1. Antispasmodic. The very dread of taking  
one has sometimes occasioned convulsions. 2. Pregnant  
women are always averse to taking vomits. Seneca  
Pungentia here to be refused. 3. Patients subject to



26. to Hemiplooe, or Hematemesis ought not to  
take Emetics; in these cases lenient purges ought  
also to be substituted in their room. 4<sup>th</sup> Opium  
gr ii. or a plentiful dose of Laudanum given two  
hours before the accession of the fit, prevents itself,  
it acts as a stimulant only. 6<sup>th</sup> Astringents, have  
been used with advantage, in the different  
of blue, white, & green; gr i. of blue vitriol given  
or four times a day, sometimes cures an Intermittent  
If Alum has produced the same effect. These remedies  
only suspend the fit. but do not eradicate the cause.  
7<sup>th</sup> Bitters, Dogwood, Sassafras, Centaury,  
Chamomile Flowers, Gentian root have been given  
with success. The Columbo root has also been used  
with advantage too in this disease.

8<sup>th</sup> Aromatics, as a nutmeg roasted in an  
onion & eaten up with a pint of Rhenish, and drunk  
an hour or two before the coming on of the fit.  
These also at times are ineffectual. 9<sup>th</sup> A mixture  
of astringency or bitters together as in the



to Bank, which is the only remedy that is generally 27.  
infallible. Steel Bank owes its superior virtue to its  
greater astringency.

10<sup>th</sup> A remedy prepared from a spider, viz. take a common  
spider, put him in a piece of bread which is to be toasted &  
made into a pile. The spider is poisonous & may act  
as a sedative & then as a stimulant.

11<sup>th</sup> Arsenic has also been used; but it is a dangerous  
remedy, I ought never to be tried, it vomits violently  
& disposes the hair to fall off from who use it.

With respect to the bank's use, it should be given  
during the Intermission & as near the accession as  
possible ℥i. ℥ss or ℥ss given just before the accession  
will have more effect than ℥ss at another time.

The best way is to give it in subternia. In infusions  
you may give it in numerous continued fivers; in the  
convalescent state of fivers the tincture may be given.  
After the first fits are broken, a dose or two of bank should  
be given in a day for some time, & as relapses happen  
either the 0<sup>th</sup> or 15 day we should give more on  
those days than usual.

Intermittents



20. Intermittents may be complicated with other diseases, as periodical fevers in different parts of the body, or even when they are not periodical, or when they are of a continued form. These fevers may be known to be intermittent by keeping our eye strictly on the season of the year, in which they occur; when these fevers are periodical, give the bark, & when they are continued, blister, bleed &c. in order to bring it to a periodical type, & then administer the bark —

There are Intermittents which don't yield to cure; this Dr. Saunders says is owing to our using an inferior kind of bark, but even the red bark does not cure them, & is even more injurious than the common.

In such cases bleeding is very necessary, & should be used in all those which continue after the cold weather has commenced. The blood is sixty, & it is necessary to bleed two or three times in Lenten. The other remedy when the bark fails is blistering which is often efficacious, which succeeds but when there is no Inflammatory Diathesis.



Hence in cases blisters are applied, with 29.  
advantage before bleeding. In most cases where  
bleeding is of advantage, a Topical Congestion takes  
place; how shall we reconcile this with Dr Cullen's  
theory of intermittents? By supposing there are two  
species of Inflammatory Diathesis, the one occurring  
when there is low & the other stories, called Indirect  
Inflammatory Diathesis —

## Continued Fevers See Cullen's Syn.

*Synocha* *sudo*. It is most probable that no inflam-  
matory Fever ever exists without Topical affection;  
in those cases that appear to have least of this local  
affection, after sometimes a slight cough, or a pain is  
felt in the right side, indicating some slight con-  
gestion in the liver. Inflammatory Diathesis  
have lessened in Europe, especially in London, owing  
to the attention to their manner of living. — In this  
country *Synocha* or Inflammatory Fevers are very  
frequent. — The Indications of fever are 1<sup>st</sup> to  
moderate



30. moderate the violence of Reaction, by moderating  
those impressions made on our bodies; increased  
heat must be avoided. The heat of the room must  
be diminished, in proportion as that of the body is in-  
creased. The temperature should be below 60°. The  
invasion of heat must be prevented by injunctions  
rest, & an interruption of all kinds of exercise. The  
way to conquer a fever is to yield to it, while chronic  
diseases are overcome by resisting them with all our  
might. There are few Incipient Fevers that are  
off by exercise, or drinking hot inflammatory  
drinks. Exercise of the mind must be avoided;  
Company should be excluded; all teasing postures  
and looks avoided. The conversation of company  
besides exercising the mind is hurtful by being  
improper subjects, such as talking of Sick people  
the deaths in the neighbourhood. The taking in  
Aliment must be avoided; nature however  
this by taking away all appetite. Particular  
irritations are to be avoided, as from Thirst, which



which should be avoided by any drinks, that 31,  
are not stimulant; water should be the basis of all  
such drinks. Heat does not stimulate the system  
are added to make them palatable. Thus is induced the  
patient to drink more freely. Herb teas are proper  
such as those made of balm with a very little sugar, and  
sweet Marjoram, Myrrh &c. Disperses, as honey water  
or fig tea with a little lime juice added to them &c. are  
very proper. When a Diarrhoea occurs, rice water  
with loaf sugar is more useful. The summer fruits cut  
fine & boiling water poured on them, afterwards sweet-  
ened make most agreeable drinks. Peaches, straw-  
berries, cherries, apples, &c. are all proper, & may be used at  
all seasons of the year, as the dried are equally proper  
with those which are not dried. Crudities are to be  
removed from the stomach. Inflammatory Fevers  
 seldom begin from the sickness of the stomach, but  
when it does occur a gentle Emetic will be of service.  
Costiveness is a very frequent symptom of inflam-  
matory fevers, hence it is of great consequence to  
evacuate the bowels, as the feces are stimulant.  
and



32 and a source of Tension; Lincents, Surges should  
used as Salts, Castor oil, Nanna, & laxatives  
is. a the use of mercury in Hepatic & other inflamm  
diseases, I have found the bowels with a pile calomel  
or two, with great advantage, it is a speedy, certain  
Splendid evacuation. The tendency to acrimony  
the fluids must be prevented by Diuretics, the  
employment of ceteris Laxatives as cold tea, the use of which  
is evinced in the small pox & Mercurial eruptions, is  
attended with success. Cold may be used in all cases  
when there is not an affection of the Lungs.

Let us next consider the utility of refrigerants, and  
Acids of all kinds are proper in this intention, but  
salts are more in general use. Nitre has been  
employed more than the others; but when there is  
a tendency to bilious Complaints, it will not lie  
on the stomach. Metallic Salts are but little used.  
Another method is to diminish the Tone & Tension  
of the Arterial system by Blood Letting —  
General Observations on Arterial Tension

Tension



33  
Tension is of two kinds Arterial & Nervous, they  
influence each other, but sometimes do occur alone. The  
tension of the Arterial system depends upon many  
circumstances. 1<sup>st</sup> On Original Tension  
2<sup>d</sup> On great bracing powers being applied, such  
as Cold & Exercise. 3<sup>d</sup> On the quantity of Aliment  
taken into the body 4<sup>th</sup> On the quality of the Aliment.  
The more Animal food taken into the body, the more  
it is disposed to arterial tension. 5<sup>th</sup> On the state  
of the alimentary canal. This canal being filled with  
feces increases arterial tension, but this acts more  
on the nervous system. Perhaps the influence of the  
Alimentary canal on the Arterial system depends  
on the quantity of feces it contains, acting as a stim-  
ulant, & contributing to keep up arterial tension.—  
6<sup>th</sup> On the state of the Arteries, which is influenced by  
two circumstances; first by Pregnancy; secondly by  
Menstruation. Women are always more disposed  
to Inflammatory diseases during Pregnancy,  
and also during Menstruation. during their  
courses—



34. courses they are more liable to take cold. To bleed  
applied in the present disease is proper —  
First, in all ages, this is generally allowed. It is equally  
proper in the old & in the young as in the middle  
Children of three months old have been bled three  
or four times in Phurisies the blood being constant  
silly. In some cases children of three weeks old have  
bled with advantage; secondly at all times when an inflam-  
-tory Diathesis occurs, no situation of the system should  
it. Physicians have generally thought it improper during  
menstruation, but so far from this being an objection, you  
should bleed more copiously. Why? An accidental stop  
or from cold is to be altogether neglected. The disease  
to be treated as an Inflammatory Fever. Say this be  
you will frequently find menstruation return, for when  
you will get greater credit, if they do not, you have nothing  
to apprehend. Men differ very much about the part  
which the blood is to be drawn. It should not be ever taken  
from a woman from the foot. — For —

1<sup>st</sup> It seldom flows plene uena. 2<sup>nd</sup> You are obliged to



35.  
disturb the Patients by making them run, therefore  
subject them to cold. If you bleed in winter, therefore cannot  
counteract the quantity of blood drawn. If you cannot  
cover the appearance of the blood. It is not safe on account  
of the tendons, which run there in great numbers. For  
these reasons I prefer bleeding in the arm, in as full a stream  
as possible. For the more suddenly the tension is taken from  
the system the better. A Patient sometimes faints suddenly  
from opening an artery by a large incision, or from lapping  
this arises suddenly from the sudden diminution of tension  
from the part from which Atonia is communicated  
to the whole system. In like manner by taking off the blood  
in as little time as possible, you do most service. Two lbs  
taken away in two hours, is not of as much service as 4 lbs  
taken away suddenly; because the Arteries, when the blood is  
drawn off slowly, have time to contract; you can also observe  
the appearance of the blood better, when drawn off quick.  
A recumbent posture of the body should be preferred. Hence  
it is a bad practice to force patients to rise from bed when  
they are to be bled. And if you can bleed them lying on



36. on their backs, it is to be preferred. For you prevent the  
muscles to act. 'Tis of consequence to inspect the blood, tho'  
it is influenced by various circumstances. Always bleed  
in a bowl. The nearer the Coagulable Lymph to the  
surface of a the more it floats in the  
serum, the greater is the Inflammatory Diathesis.  
Yellow serum is also a mark of inflammatory fever, tho'  
occurs also in the putrid. Hence two extremes meet in a  
point. The employment of blood-letting requires that  
you will find many fevers, where you will be in doubt  
about the propriety of bleeding. You will determine

1<sup>st</sup> By the nature of the prevailing Epidemic  
2<sup>d</sup> By the nature of the remote cause, whether Contagion  
or Miasmata. It is common to forbid bleeding, when the  
presumption is that the disease is brought on by Contagion.  
In summer this is a good rule, in winter it is by no  
means to be adhered to, as the inflammatory diathesis  
at this season, is so powerful, as to overcome the Septic  
tendency of the contagion. 3<sup>d</sup> The season & climate



which the disease occurs, is of consequence ought to be 37.  
attended to. The Climate in which a nervous constitution  
has been formed is still worth attending to. A Londoner  
will not bear bleeding above once, because their fevers  
tend so speedily to Typhus. But an American in London  
if he is seized with a Pleurisy for instance treated according  
to the London method it will certainly end in Empyema.

1<sup>st</sup> The degree of Phlogistic Diathesis —

2<sup>nd</sup> The period of the Disease.

**Emetics** in fevers are used for two purposes;  
1<sup>st</sup> to discharge the contents of the stomach; & 2<sup>nd</sup> as a Diaphoresis.  
There is a great sympathy between the stomach & skin over  
the whole body. The most common emetic in fevers is  
Antimony —

Of all the preparations of Antimony  
Tartar Emetic is the best.

To make Antimonial Wine.

℞ Tart. Emet. gr ii Vin. Lisbon ℥ i. This method  
of making Emetic Wine is the best, as it renders the  
dose certain. ℞ul: 60 contain 1/4 gr of Tart. Emet. The



30 The tension of the system is also to be taken down by  
exciting nausea by small doses of emetics. There are  
also other methods used for this purpose, such as  
Blisters, as Antispasmodics & Evacuants, Irritating  
hermits as stimulents.

The manner the Blisters are applied to the parts affected  
by inflammation the better I more certain their effect  
for then they act as Antispasmodics. There is a species  
of sympathy occasioned, by continuation of membranes, as  
the irritation felt on the glans penis in affections of  
the bladder; throat felt in the fauces, when worms are  
in the stomach. In pure inflammatory fevers, <sup>blisters</sup> act as  
Antispasmodics, if there be no topical inflammation  
where this is the case, as in a Pleurisy, they may do good  
in evacuations also. In irritable hermits, if too great  
tension is occasioned their application they must be removed.  
It is a common practice to let blisters lie 12 hours  
but the true rule is till the blisters rise, and keep you  
them as stimulents. Pieces of muslin laid between  
the skin & blister are said to prevent Strangury.



They do certainly prevent the flesh adhering to  
 blister, which is sometimes of consequence to prevent.  
 Drinking from lb. ii to lb. iii Rhenish water, will infal-  
 libly prevent the stranguary, if the patient begins to  
 drink it as soon as the blister is applied. If this has  
 neglected, & the stranguary has come on, it may sig-  
 nantly be removed by drinking Rhenish water, but  
 sometimes a little Senna is necessary. Cabbage  
 leaves may be applied when we wish to draw Virritate  
 the blisters, but should not be applied to Possible habits  
 They should not be used when there is a septic tendency  
 because they quickly putrify, & may increase the comp-  
 leint, or at least they render the room very offensive.  
 The best application is an ointment prepared of wax &  
 oil; the skin should not be taken off, when wax & oil can  
 not be procured, a rag dipped in fresh butter, or melted butter  
 put will answer as well.

### Some further observations on bleeding—

1<sup>st</sup> The degree of Phlogistic Diathesis, the period of the disease  
 & the manner of living, also the patient's habit of bleeding.  
 2<sup>nd</sup> The appearance of the blood drawn, should all be taken into



40. into consideration (2<sup>d</sup> Warm bathing should be  
used for letting off tension. This was a famous remedy among  
the ancients: but if any Septic tendency prevails, it  
will bring on, unexpectedly, great weakness. It is much  
more troublesome in most cases, notwithstanding Dr.  
Galtrist's Treatise, it is unsuccessful & sometimes hurtful.

### Typhus, mitior, gravior, and Pterodes, or Yellow Fever of the West-Indies

These include all cases of Nervous Putrid Fevers  
that exist. Fluxon's slow, Nervous Fever is an accurate  
description of Typhus Mitior. See Cullen's Def<sup>n</sup>.

The cure of Typhus mitior consists in alleviating the  
debility, and removing the cause of it. Effects of debility  
are alleviated; 1<sup>st</sup> by increasing the action of the heart & vessels  
by Tonics. Cold water is a powerful Tonic acts by its sensible  
qualities, & by the pure air you derive by exposing the patient  
to it. I have no experience of the effects of cold as a tonic  
in this disease.

Tonics are either regulables or irregulables. The regulables  
Cortex Peru: which is the best Tonic; in the Typhus mitior.



it may be given with safety at the 14<sup>th</sup> day. There is common 41.  
only a little Inflammatory Diathesis in the nervous Fever  
which may render the exhibition of the Venk improper, till  
it takes on the quatern Type. The Inflammatory Diathesis is  
to be the criterion, for we sometimes give the Venk before the  
14<sup>th</sup> day, & sometimes not till after. — In the Typhus Gravior  
you may begin the use of it immediately after usual  
Evacuations, & not only by the mouth, but by injection,  
also, baths, Stomentations or Cataplasms, which are some  
times as large as to envelope the whole body. The stomach  
will often bear Venk when nothing else will remain in it.

2<sup>d</sup> Stimulants, as wine and Aromatics, all these  
appear to be useless. Volatile Salts, as stimulant may be  
given in both Milder & Gravior, from 5 to 10 grs. It may be  
given if necessary at any time of the day. In all cases  
of Inflammatory diathesis Opium may be improper by  
its stimulus, except in affections of the Lungs, where the  
irritation occasioned by the Opium is not so great, as  
what would be by coughing. Wine must be given in  
much greater quantity, than is commonly the case. we  
must be governed by the degree of the disease, & the state



LP state of the pulse. It is an Antiseptic as well as a Stimulant.  
From one to four pints may be given in day with  
safety. It is almost impossible to make a patient drunk  
under a nervous fever, by any quantity of wine  
you can give. Suppose the standard of health to be  
20, at which time a pint of wine will intoxicate;  
then it sinks to 10, it will take a quart, & so on accor-  
ding to the degree of debility, & to people who have  
been in the habit of drinking wine, we double or triple  
the quantity. It may be given unmixed. Port wine  
is good, but Madeira is the best of all wines for  
two reasons; 1<sup>st</sup> because it possesses more Antiseptic  
virtues & 2<sup>d</sup> because it is not decomposed by the heat  
of the stomach. I can easily conceive that Madeira  
is thrown out unchanged by perspiration. For the  
of the feet, & Cataplasms composed of bread and milk  
with raw Garlic beaten up in it, stimulate gently & slightly  
& inflame the parts. A Patient had two such poultices  
applied while he was delirious, & in the succeeding morning  
he was sensible & tasted garlic, tho he knew not that any



43  
thing had been applied the night before, a  
flux of its entering the circulation. Flower of mustard  
is a more speedy stimulant, but in Typhus mitior  
is seldom necessary. In Apoplexy Mustard is to be pre-  
ferred, on acc<sup>t</sup> of its quicker stimulant. Air sedgeons cut  
in half are sometimes applied to the feet, but this is a  
rude and sometimes a dangerous remedy. Pyemua &  
rimiger are also used by the old women, but is not so  
effectual as garlic or mustard. The nervous fevers are  
sometimes complicated with the putrid, & sometimes  
sometimes with Inflammatory fevers. Now we must  
use our judgement and not be governed by rote  
merely. In Typhus gravior, the intentions of cure are,  
to divert the tendency of the fluids to putrefaction,  
this is done, by avoiding the application of putrid matters,  
& by removing the patient from putrid air, when  
that cannot be done, the air must be corrected by  
keeping the windows and doors open. Hence putrid  
fevers spread more in winter than in summer  
because the windows & doors cannot be kept open.  
Boenno



46 Drains make the best hospitals in the summer,  
especially the most exposed to the south. When a drain  
cannot be procured, the patient should be carried out  
and placed under a tree. The air may<sup>be</sup> corrected  
by certain extractions, as from branches of trees  
cut & strown upon the floor. The willow tree exhales  
the greatest quantity of this pure air. Dr. Priestley  
obtained an acid, that could correct the pure air,  
by pouring Vitriolic Acid on common salt.  
Vinegar has the same effect when poured on a hot  
or stone. The accumulation of the patients own  
effluvia should be avoided by changing his  
bed-cloaths, & body-linen; his tongue should be cleared  
as frequently as possible, & all excrementitious matters  
removed very carefully. While Doct. F. H. was  
Physician to General to the British Army, he was  
on board one of the Transports, & in the hold he found  
many sick, among whom he soon was one  
who appeared to be dead. The Doct. him to be



45  
taken to shore, & landed immediately, he was  
accordingly thrown into the boat and four men rowed  
him to land. Scarcely the vessel, a fresh wind blew off the  
land, directly into the men's face; he promptly began to  
breathe, & before they reached the shore, he was able to speak,  
instead of burying him, they placed him under a  
tree in the cool air; the consequence of this was, that in a  
very short time he recovered. This is a most remarkable  
instance of the efficacy of cool air. The stomach & intestines  
must be kept clean by vomits & purges. In the beginning  
of 19, out of 20, putrid dysenteries vomits will be necessary, and  
in the progress where there is a constant sickness at the  
stomach accompanied by a full pulse. When there  
is not much nausea, the bowels should be evacua-  
ted every ~~other~~ other day by lenient purges.

Doct. Morro thinks that the bile is an excre-  
tion, if it is so, it is of the utmost consequence to disch-  
arge it especially in a putrid fever it is more acid  
than at any other time. Keep your eye on the state  
of the alimentary canal always steadily. An  
emetic



46 Emetic given just as the first symptom of a putrid  
fever appears, will always prevent it. In the progress  
of the disease it is always necessary to cleanse the  
alimentary canal, with lenient purges. A sailor  
discharged from a prison ship shortly after his  
dismissal was seized with a putrid fever; in a day  
or two his weakness had proceeded to a very great  
degree, more so than could be expected from the length  
of the disease: suspecting that it was from putrid matter  
in the stomach I administered to him Tart. Emet. gr. ʒss  
I sent a young Gentleman with him to assist in its  
operation, with orders, to continue his having taken  
a vomit & to give him a little liquid Laudanum, if  
the vomiting should be excessive. The next day  
when I called to see him I found him sitting up, at  
the front door. If quinine be proper in every stage of  
a fever, when there is no inflammation, it must  
also be proper in a putrid fever after an Emetic, to  
allay the irritation. Antiseptics. Bark,  
wine & Stills of all kinds, also porter, wine and



bank are still more necessary here than 47.  
The Typhus mitior. Doct. Lettson has recommen-  
ded porter; it is a tonic & antiseptic, cheaper than wine  
of the best quality & not apt to be adulterated, from  
its bitterness it often stops vomiting. Bitters are Anti-  
spasmodic. Columbo Root has especially been used with  
advantage. Chamomile Tea is also very good. Fixed  
air for a while had great reputation, but is of no  
service besides being troublesome. The convalescent  
state of nervous Spotted fevers is often attended with  
great danger, therefore you are not to leave your  
patient immediately, but you must still consider him  
as a subject of medicine. For 1<sup>st</sup> They often relapse.  
2<sup>nd</sup> Heavy air & snow weathers. Symptoms are swelled  
legs, Anorexia, puking in the morning, Night sweats,  
wakefulness, falling off of the hair, & its turning grey.  
The mind is also much affected in the convalescent state,  
hence Amnesia or Amnesia often follow this disease.  
The memory & indeed all the other faculties are  
injured by it. Dr. Leland, at six years of age was  
seized



40 seized with a putrid fever, before his illness, he could  
read but when he got well he knew not a letter. The  
voice is sometimes much affected in Putrid Fevers,  
To guard against them in conveniences, we must have  
in restorative Medicine & Diet. Of all restoratives  
Auxon's Tincture of Nuttall, is the most excellent. It  
taste spoonful, or wine glass full may be given three  
or four times a day. Porter as a medicine, & as an article  
of diet is very proper. Oysters form a proper diet, are  
easy of digestion and afford much nutriment. They  
should be eaten raw, for in this state, they are most  
easily digested: there is as much difference between  
raw oyster & one that is boiled, or roasted, as, between an  
egg that is soft, & one that is boiled hard. Another article  
of diet is Chocolate, & when the stomach rejects every thing  
else, chocolate will be retained, it is probable that there is  
some sedative quality in the oil of the Cocoa Nut. The  
vulgar say that it is heavy & cannot be thrown up.

There have been great revolutions in the cause of  
fevers within these 15 or 20 years past, for which we are  
chiefly indebted to Dr. Cullen. We have learnt from



49  
from him the great use of emetics, purging,  
Opium, wine, Steenk, which are the hinges on which  
the cure of fevers turn. Formerly wine & Steenk in  
infusion was only given: but now we give wine  
along with Steenk in substance, without waiting  
for any intermission, especially where there is any  
Septic Diathesis. The use of cool air & cool regimen  
is another great improvement. Ten patients out of  
an hundred used to die formerly in all kinds of fevers,  
but now not one in an hundred, or even 300, in this  
city die, owing to their being generally treated in the  
manner recommended.

*Synochus*, see Cullen's Synopsis  
On this disease I have nothing to say. In its inflamm-  
atory state, treat it as a *Synocha*, but when it changes  
to a *Typhus*, it must be treated as such.

*Pectica* is a symptomatic disease,  
consequent on wounds, ulcers, venereal disease &c.  
and appears to depend on debility, & is to be cured by tonic  
medicines, as the cold bath &c.

*Phlegmasia*, for the definition see Cullen.

Philosophie



50 Phlogosis. for the definition see Cullen.

Topical inflammation of any part of the body is called Phlogosis or Phlegmon. There are two species viz. Phlogosis Acuta & Phlogosis Chronica. Phlogosis varies in its form. Ascat, it tends to resolution, suppuration, & Gangrene. Our business is, in the first place to attempt resolution. 1<sup>st</sup> Dry bleeding where the inflammation is so considerable as to import fulness of the pulse.

2<sup>d</sup> Purgings, where the inflammation occurs in the upper parts of the patient, as in the head & throat. 3<sup>d</sup> Light, vegetable diet.

4<sup>th</sup> Cold air & water, Lead water has been of use to soothe & mitigate topical inflammation. Emollient washes

of bitter herbs, especially when the inflammation is on the limbs. Vinegar is frequently added. If this fails

bring about resolution, we must try to suppurate the inflammation. Emollient poultices of bread & milk. These had been

used, also figs & lilly roots & a plaster made of honey & flour.

The Eye poultice is to be preferred. It is thus made, one pint of beer, one gill of Eye, & as much bread as will make it into a

consistence as spoonful of oil. This stimulates gently, & is an excellent application to a swelled breast. Crude Sal



Sal Ammoniac dissolved in water is accounted an 51.  
excellent application. Children are subject to infl  
ammation in the neck for two causes. 1<sup>st</sup> from the  
sore throat; 2<sup>d</sup> from teething, And Lye poultices are  
most powerful applications in these cases. A swelled  
breast is a most troublesome disorder, we should  
therefore endeavour to prevent it. In England such  
a thing as a swelled breast is scarcely ever heard of.  
Previous to a womans lying, we should make it  
a practice to draw her breast with her finger, or wash them  
with a decoction of white oak bark. This prepares the  
excretory vessels to discharge the milk when the child  
is born: when this is neglected, after birth the milk stagnates  
& produces irritation, inflammation & phlegmon. There  
is another cause Viz. cold or fever falling on the breast.  
We must attempt to disperse it by Sp<sup>t</sup>. vin<sup>i</sup>, gentle purges &  
drawing the nipple gently; by lead water, low diet, a cold  
large leaf, & a solution of powder Sal ammoniac in water.  
If then pain and tendency to suppurate takes place,  
we must have recourse to the Emollient, Especially the  
Lye



32 *Leys poultice.* It is improper to open the breast soon, it should be opened in the most dependent part, a large incision is unnecessary, a puncture will be sufficient often times. —

A sore nipple is a painful & distressing disorder. In some cases the lead water applications are of great service. Lead mixed with oil has frequently succeeded, after the common applications of Lead water have proved ineffectual. Women sometimes discharge blood instead of milk from their breasts. It arises from a great relaxation & disordered state of the secretion. It is cured by bark, & wrapping the breast in a flannel dip't in claret or port wine. It is a rare disease.

*Paronychia* or Felon from bruise or cold. It is an inflammation of the pulvium of the first or 2<sup>d</sup> joints of the fingers. When it first makes its appearance dipping the finger into boiling vinegar will prevent its progress, distilled vinegar will have the same effect. How this acts ~~will have the same effect~~ is not easy to determine. Another method of cure is cutting down the bone in a longitudinal direction. If this have been used without success, or neglected, the disease is often



then dangerous, frequently tedious. If the leon is 53  
various take it off.

**INTRA**, appears on the back, it comes on with  
itching, spreads over the parts resembling an Herpes  
vomb; it is necessary to open their little pustules or  
vesicles, keep them clean, & in almost all cases to give  
the back.

**BURNS.** The leadwater is a proper & powerful  
remedy, an ointment prepared of copper or white lead  
is a most excellent application. Soft poultices are use-  
ful. The common remedy in this disease is scraped  
potatoes. Molasses has been used, but is irritating, the  
best application is a bread & milk poultice Dr. Hays  
recommends an ointment of fine Sweet oil. it is  
painful & has been frequently used with disadvantage  
in the London Hospitals —

**Chilblains.** are frequently to be prevented from  
inflaming by cataplasms of snow & ice, or by cold  
water, the part affected must be rubbed; & fire avoided.  
When inflamed, or when a green comes on, we  
must use the remedies proper for such complaints.  
(In



54. An abscess should be opened by the knife or caustic  
The Duke should be opened by caustic, & Mass for  
the purpose of destroying as much of the diseased  
part as possible

**Gangrene**, to cure it, make deep incisions, & re-  
solutions, & apply stimulants, as turpentine; when  
the whole system is affected, Mark must be given in  
large quantities

## **Ophthalmia**, see Cullen

It is either Idiopathic or Symptomatic. Some eyes  
are Epidemic, in consequence of their being asymptomatic  
of fever, so that the fever not the sore eyes is the epidemic  
disease, which fever may be so slight as not to be detected  
The cure of the Idiopathic, whether it is an Ophthalmia  
of the membrane or is generally the same

It does not often extend the inflammatory diathesis to  
the whole system, tho this is sometimes the case. If this Diathesis  
this happens bleeding is necessary. If this Diathesis  
is not general, we must use topical bleedings by  
leeches, or as a substitute cupping the temples.  
Purges are of great consequence & should be given  
immediately



55  
immediately after bleeding. There is a kind of  
inflammation, that ends rather in Sphacelus  
or Gangrene, in which case the task is injurious  
is to be cured by topical applications only. It is very  
frequently an attendant on the Scrophulous, venereal  
disease, Small Pox, Measles, in the first instance it is to be  
cured by task. Blisters are very serviceable few cases  
require a blister on the neck, one behind each ear in  
general is sufficient. Blisters have been applied to the  
temples with the most happy effects, much care should  
be taken to prevent the fluid from getting into the eyes.  
After the evacuations, Tonics of the metallic kind are  
preferable none more so than lead water. A poultice may  
be applied to the eyes composed of bread soaked in lead  
water. Sometimes the pain resists all these remedies,  
in which case Opium in solution is used with the most  
happy effects. When this is applied without success we  
may make a poultice, as of Lead water. If this fails the  
steam of warm water will sometimes succeed, but there  
is a suspicion of its being improper upon account of  
its relaxing quality. Electricity drawing sparks of



56. If fire from Mercury has efficaciously carried off the inflammation. Hence the electric fluid is a powerful tonic & should be used after the evacuations mentioned. The light should be avoided on account of its great irritation. The best way to avoid it, is to confine the patient to a room entirely dark. This is Dr. Cullen's opinion to avoid irritation from fire. A very vivid fire will always increase & sometimes even bring on Ophthalmia. Hickory wood by its vivid flame & great heat often brings it on. The changing this wood for oak in these cases is proper. In an inflammation of the palpebrae, there is sometimes a dryness of the eye itself. It may be corrected by Sapis Lactem maris finely levigated & mixed with fresh butter. Rubbing the eyes with this ointment when this dryness arises from heat & dryness is proper.

**Phrenitis.** see Doctr. Cullen's Diffin.  
The idiopathic phrenitis, is very common but the symptomatic is more so. For the cause consult Dr. Cullen's Practice of Physic. The cure whether

Scrio.



Idiopathic or Symptomatic is the same. The 57.  
indications are 1<sup>st</sup> Bleeding very copious by; opening  
the temporal artery has been recommended;  
also the jugular vein perhaps XVI. & blood taken  
there would be of as much service XV. from the  
arm, but most patients would rather lose it from  
the latter, in a larger quantity. 2<sup>ly</sup> opening the  
veins by clysters & purges 3<sup>ly</sup> ~~shaving the head &~~  
applying cold water or vinegar, the latter should  
be preferred on account of its sedative virtue. 4.  
Blisters applied to the head are of great service, they  
seldom raise a blister here 5<sup>th</sup> Let air is of great  
consequence: an erect posture should be recommen-  
ded in this disease. Opium is certainly injurious.

**Cynanche** or sore throat Dis<sup>n</sup> Varietas see Cullen.  
Tonsillitis the common inflammatory sore throat. The  
Tonsils sometimes ulcerate only and discharge but little,  
at other times they suppurate & discharge a great quan-  
tity. When the pulse is hard, an inflammatory diathesis,  
a small white spot on the tonsils, we are notwithstanding  
to.



58. To treat it as an inflammatory disease, especially if the  
Tonsil be much swelled. The tonsils do not always ulcerate  
or suppurate, the inflammation is sometimes resolved.  
The cure consists in purging, bleeding, blistering  
round the throat ~~where the tonsils are~~ where the patient  
is in danger of suffocating. Applied here, they are of  
more service than behind the ear. Gargles of permanganate  
of Potash, in sage tea are useful. Sir John Pringle recom-  
mends the volatile liniment, where blisters are not used,  
to be applied to the neck, this is an excellent appli-  
cation.

*Maligna*. Diff. in Cullen. On the subject  
see Thurn, Tothergill & D. Johnston. This species  
Cyreniche has been confounded with the Scarlatina  
more. Distinguishing mark, the much greater mortality  
of the Maligna. It generally attacks the young tho it is not  
peculiar to that age, some authors say it is the same disease  
only different in degree. But we might as well say that  
the Intermittent Fever & Typhus were the same disease  
because there are symptoms in common with both.



This disease in the Spring & Winter in moist & 39.  
warm weather, attacks women & children, & black  
eyed children sicker than others. For black eyed people  
possess more sensibility. It is attended with watery  
eyes, a flat and crawling voice, & lax symptoms of the  
Typhus Gravior. CURE. Emetics, Turbith Mineral  
was given when the disease prevailed in this city, with  
the greatest advantage, not a patient died who took  
a vomit fit in the beginning of the disease. For 1<sup>st</sup>  
it operates quickly. 2<sup>d</sup> copiously. 3<sup>d</sup> it stimulates the  
glands, generally, so as to excite a more copious dis-  
charge. Probably acts by giving a little tone.

Doct. Ogden of Long Island first gave Calomel com-  
bined with Opium, in this disease. Immediately after  
emetics we are to have recourse to bark & a Kirroot &  
red wine. Detergent gargles were used with advantage  
made of rose water, honey & muriatic acid. Tumefactions  
of myrrh & tincture were used into the throat as often as  
the patient can bear them and found serviceable.

Trachealis. De Sa Cullen. It is without synocha  
The



60. The particular barking cough is a pathognomonic sign  
of the presence of the disease all the other symptoms occur  
in many others Dr. Home first called it the Croup  
Dr. Michael calls it Angina Polysera, but  
this includes but one species, thence it is an improper  
name. Doct. Monro calls it Suffocatio Stridula  
In the state of Pennsylvania it is called the hives. Whose  
name is taken from the word hives, because in the  
complaint the breast hives. There have been disputes  
about the general place of this disease. Cullen places  
it among the Pleuroasias, & Monro among Epistaxis  
It may be inflammatory, & may depend upon suppressed  
excretions; It may be spasmodic. That particular cough  
called by Cullen Tussis Clammosa often happens in the late  
stage of the small pox, but is then only a Symptom  
in the Scarlatina Anginosa. Another dispute is whether  
it be owing to spasm or an Effusion of mucus in the  
form of a membrane different opinions have been enter-  
tained. Dr. Michael thought it always depended on effusion.  
Dr. Monro was of the same opinion. But from  
the



The symptoms, from the method of cure, and lastly<sup>61</sup>  
from dissection, there is not a doubt of there being two  
species, or varieties, Viz. Spasmodic, Humoral or Catarrhal.

The spasmodic is known first by its coming on sudd-  
enly, especially after the first sleep at night. Children  
sometimes go to bed well at night, and, in an hour after,  
wake with this disorder. 2. it goes off suddenly. This cannot  
be accounted for but by supposing spasm. 3. by its yielding  
to antispasmodics, particularly warm bathing. 4. its  
coming on periodically. It sometimes comes on in the  
evening, & disappears the following morning. It returns  
again at the same time next evening.

The Humoral is known. 1. by its coming on gra-  
dually. Two or three days indisposition commonly  
precedes its attack, & the Patients will tell you they think it a com-  
mon cold only. 2. Its going off gradually. 3. its contin-  
uing with uniformity, and without any intermission of  
the symptoms. 4. its not yielding to the same remedies  
as the Spasmodic, particularly warm bathing. The spasmodic  
is.



62. is cured, 1<sup>st</sup> by bleeding if the child is plethoric, or  
the disease attacks it in the time of inflamm<sup>y</sup> diseases.

2<sup>d</sup> Emetics which are powerful Antispasmodics.

3<sup>d</sup> Antispasmodics, as warm bathing, gentle  
and liquid leudermum, blisters as Antispasmodics  
Hately by stimulating cataplasms of gentle to the  
or if there is great danger mustard seed -

The Humoral is treated differently. Emetics should  
begin the cure, if inflammation is suspected, which  
is known by the hardness & fullness of the pulse bleeding  
may be necessary: but our principal dependence  
is on Calomel in large doses, from ʒss to ʒjss may  
be given in a day while the disease continues. If  
it purge too much, restrain it by leudermum, but a  
moderate diarrhoea is of advantage. Calomel acts  
by stimulating the glands of the Salivary & the viscera  
promoting a more plentiful secretion & excretion of  
all the humors, and of consequence checks the effusion  
into the trachea. See Rushes & Graves. Blisters act in  
the same way & c. by their irritating & evacuating qualities.



This is said to be a disease of children only. I have 63.  
known more than one case of it in adults. One fact is  
in the Cynanche Trachealis, that the hoarseness  
and cough continue after the danger of the dis-  
ease is over; but the loss of that venting voice  
the less dangerous is to be apprehended. Since I then  
adopted this principle I have lost but one patient  
in the hives, which is now 15 years ago. At that time  
was the humoralis, to which I was not called till  
the third day. Sweating was used formerly used with  
little success which was brought on by fumigations  
Scurviger

**Pharyngea** agrees in many respects with  
the Tonsillaris, but the difficulty of breathing is more  
remarkable. Bleisters are very useful in this species of Synom.

**Parotidea**, or the Mumps. This disease is  
apt to fall into the testicles in men, and into the breasts  
in women after a crisis has taken place. In chil-  
dren the swelling is apt to suppurate. It becomes  
very



64 very troublesome. The cure consists in leeches  
punges and discutient Applications.

## Pneumonia. Def<sup>n</sup> in Cullen.

The pain is very often in the back, and sometimes  
extends as low down as the kidney, as well as the  
side & breast and even sometimes as high as the

Peripneumonia. is the first focus in Cullen.

This evidently includes peripneumonia notha, which

Sydenham & Astruc have described. The pulse

is slower full & soft than heard, if the patient happens

to be seized with this disease, standing, sitting, lying

upon the back or side, he generally is obliged to

keep that posture during the whole disease.

There is often inflammation connected with

this disease, but there is a suspicion that is dependent

sometimes on an effusion of blood into the lungs

occasioned perhaps by irritation. The Gout

falling on the lungs sometimes produces this

com



completing. Hence it may be called a kind of 65.  
apoplexy in the lungs viz Effusion. You must not be  
imposed upon by the pulse; if it is full and hard you  
will proceed with the more confidence, but if it is small  
and weak do not fear to bleed. A Negro Man in the  
Dorchester House was seized with a Pneumonia. &  
appeared to be nearly dying. His pulse was small &  
weak. We bled him with the most marked success. He went  
abroad the next day. This species does not go off with  
expectoration. Bleeding seems to procure a complete solu-  
tion of the disease. This disease is Idiopathic & Symptom-  
atic. When a consumptive patient goes off before the na-  
tural time of the disease, we suspect this disease to have  
taken place, & to have been the cause of his unexpected death.

Pleuritis is the second species in Cullen's Synopsis.  
The spilling tinged with blood is by no means an unfa-  
vourable symptom in this disease. This Idiopathic  
or symptomatic. In the fall of the year Manticulary in  
the southern climates we find a pleuritis biliosa described  
by Thucam, which is a very dangerous disease. Gen. &



66. Gen. Lee died of it on the 5<sup>th</sup> or 7<sup>th</sup> day. More  
people die of Pleurisy in Maryland & Virginia  
than in Pennsylvania, owing to its being accompanied  
with a bilious fever. — Fluxum describes a pleurisy accom-  
panied with putrid symptoms. The blood is thin & dissolved.  
In this case the fever arose from contagion & the Pleurisy  
was only Symptomatic. It must be treated as a Typhus  
with Snake root, Eccl. Alk. Bark &c. The Idiopathic is cured  
by bleeding copiously. This is indispensably necessary. One  
copious bleeding will sometimes cure the disease. To the  
contrary, it is very remarkable, that the patients require  
the first bleeding to be very copious because they seldom  
bear a second. XVI ℥ of blood may be taken with  
safety and advantage. Venen. XX ℥. If the first bleeding  
does not relieve, & the hard pulse continues, we must con-  
tinue to bleed, & not be deterred by the apprehensions of the patient  
or an acc. of sex. Females seem to bear bleeding & to  
require it more than men. I bled one woman 3 times  
in the course of the disease. They were both pregnant  
both recovered & are now living & healthy. I once attended a  
patient



patient who lost 140.3 of blood in this disease. 67  
This disorder was brought on by a shot through his  
chest. His name was M<sup>r</sup> Thuron a captain in the  
British army, and was wounded in the battle of Prince  
town. His recovery was very slow. So highly irritable  
was his arterial system, that during the whole of his  
illness, I was obliged to restrain him to water, in which bread  
had been soaked. He took no other nourishment. Sago,  
Pomada, Pisons were all strictly forbidden. Indistinctly  
avoided. § LXX. are commonly taken away, the two  
common mentioned lost probably 100 each; some of them rather  
more. Next lenient purges are proper. Slightly Diaphoresis  
is to be promoted by small doses of Antimonial emulsions.  
There is a vegetable substance called Seneka Snake  
root. It acts without irritating by nauseating. It is a very  
very efficacious medicine in this disease. No listers applied  
as near the part affected as possible are of great service  
They should be applied early, for here they act as va-  
cuants. Glysters should be used ~~when purges~~ when purges  
have not the desired effect &c. &c. Most of keeping the bowels  
regular.



60. regular. When the inflammatory diathesis is subdued  
then we must use Expectorants. After all this remedy  
if the disease does not abate, we must have recourse  
to Expectorants. The Cod. Alb. is the most proper  
given in Aug<sup>4</sup> & Sept<sup>4</sup> every two hours. Demulcents  
should be prescribed, when the cough is troublesome  
for the natural mucus of the Throat being abraded,  
even the air will induce a cough. Flax seed Tea is the  
best & proves agreeable with many people in this disease.  
Broom tea is also proper. When a patient has been in  
the habit of drinking spirits, it may be proper to  
add a spoonful or two to these demulcents, in order  
to induce him to drink larger quantities. To make  
a demulcion. boil the Broom for half an hour, then strain  
it, add sugar or honey, & the juice of a lime or Lemon.  
Flax seed tea may be made in the same way. This  
makes a most agreeable drink, & it is of consequence to  
make drinks as agreeable as possible, in order to induce  
the sick to drink more freely. As soon as an incipient  
Cerebration



69.  
resolution & expectoration proceed, we must give  
syrup if an irritating cough attends. Emetics  
are said to be proper, but come with more advantage  
after a resolution takes place. When the patient seems to  
sink under the weight of the matter in the lungs, which  
he has not strength enough to throw off, gentle vomits of  
Ipecacuan are to be preferred: an inhaler should be  
used through which the patient must receive the  
vapours of bran-tee. Dr. Leper gave also of a  
tincture made of camphor & cam. Marides, by which  
he used to excite an inflammation in the urinary  
passages, it did no good until this effect was produced.  
In desperate cases it may be admissible, it acts upon  
inflammation taking off another. Pleurisy is  
apt to terminate in Empyema or Empyema. After  
fatal, too in the act of respiration. For this definition  
see Cullen's Synopsis & Cullen's Surgery. Empyema is one of the  
most frequent causes that produce consumption,  
but is the least fatal. Hence we should not abandon



70 our patients when a vomica is formed. If the patient  
is not of a consumptive make, & especially if the season  
of the year is such, as to admit of using vegetables &  
milk diet with moderate exercise there is reason to hope  
a cure. Young gentlemen recovered from a Peritonitis  
which terminated in a Vomica & Empyema, when  
got able to go abroad he went to Portugal, where  
he so far recovered his health as to marry.

**Carditis.** This disease says Rush & Howe  
never seen. The Synocha is said to be its most  
distinguishing Characteristic. The syncope is also  
a symptom of it, happening without debility when  
in erect posture.

**Peritonitis** *nona venerea.* See Cullen.

**Gastritis** is of two kinds, and is a  
common disease. Diff. in Cullen. It is often Paissia-  
tic, or at least from internal causes as any Acid  
taken into the stomach, for instance Arumic. The



The most frequent cause in this country is 71.  
cold drinks; they will sometimes produce sudden  
death. Three circumstances must concur that  
they produce this disease: 1. extreme heat of the body  
2. the liquor must be very cold 3. A large quantity  
must be taken in. The symptoms which occur in this  
disease are numbness of the limbs, giddiness, spasms either  
Cholic or Tonic. This disease is prevented by cooling the  
body diminishing the quantity of the drink, or by  
receiving the first shock on the hands &c.  
When the disease comes on Laudanum is the  
only remedy. Vomits are improper. An inflamma-  
tion of the liver & sometimes Chronic diseases are  
occasioned by cold drinks. In the cure of Gastritis,  
bleeding, blistering, dilute acids, & demulcent drinks  
are to be <sup>exhibited</sup> ~~exhibited~~. Gastritis Ephemera is of the  
Chronic kind. It is more common than we are  
apt to imagine.

Enteritis is more common than Gastritis, &c.



72 it is produced by acid matters taken in, & especially by  
the Cholic. Hence, bleeding is necessary in almost  
every stage of the Cholic. Def. in Cullen. The pulse  
is of the Typhus kind. Cure. the same as of Gastritis.

**Hepatitis** See Cullen's Synopsis. This disease is  
more frequent than the foregoing. The pain sometimes  
extends across the left Hypochondrium, on acct of the  
liver being enlarged by the inflammation. This disease  
is sometimes taken for a Pleurisy. Sometimes a yellow  
colour of the skin & frequently of the eye attends. It comes  
on sometimes like a Catarrh & this is the worst kind. The  
Hepatitis is either acute or chronic, the latter sometimes  
comes on like a Jaundice, the yellowness of the eyes more  
frequently attends this than the acute species. That, infla-  
mmation, suppuration, or gangrene is present from  
Gangrene may take place is proven from dissections.  
The pulse which is hard will always indicate the presence  
of this disease, hence it is supposed there is no hepatitis  
without topical inflammation somewhere. When



73.  
In inflammatory fever is present, we may always  
pronounce that there is inflammation tho it may  
be concealed, and a Physician gains credit by affirming  
that the pain will come on. A stone in the bladder  
produces irritation on the Glans Penis, & a stone  
in the Kidney will produce vomiting, hence there are  
two instances, Impression in one place, & sensation  
in another. The Chronic is said to affect the Paren-  
chymatous, while the acute affects the membranous  
part of the liver. This disease occurs most frequently  
in warm climates. The cure consists 1<sup>st</sup> in exhibit-  
ing Glysters & bleeding copiously 2<sup>d</sup> in giving calomel  
in large doses. This was first given in the East Indies  
now it is administered universally. There is congestion  
in every case of inflammation especially that of the  
liver. Calomel is an universal stimulant & promotes  
greater secretions & excretions. It promotes the afflux of  
humors to the stomach & intestines, & consequently opens it  
in the liver. The quantity may be given even to 100 grs.  
Mercury seldom salivates when a fever is present. Blisters  
are very powerful and should be applied large & directly over,



74. over the part affected. If the inflammation is on the outside of the liver, it has terminated in an Abscess, it points outwardly & should be opened as a common Abscess. But if from chills & the appearance of rigors & variation of the internal part of the liver, the knife ought not to be used, You are commonly obliged to wait the operations of Nature or endeavour to break it off by emetics or purges —

*Splenitis.* I have nothing to say on this disease, but what you will find in Dr. Cullen.

*Nephritis.* see Cullen. It is more common than the latter disease. In this Urine is red, the vomiting is a Pathognomonic Symptom, the drawing up the Testicles in men. There is one Symptom which Dr. Cullen has not mentioned viz. a Cholic. The Nephritis is seldom Idiopathic. The symptoms come on by Gravel, Falls, strokes, or, or straining in the back, & being a hard pressing horse &c. CUR. This consists in bleeding, Lenient purges which ever be in aliquod form & listers, the effect of which is wonderful, for the Colon you know lies

Al-



directly across the kidneys, given as a fomentation 75.  
then filled with an emollient glistor. The warm bath  
and demulcent drinks are of consequence. This may  
be made of flax seed or bran, after this Anodynes  
must be given, & emollient fomentations applied to  
the back or warm water inclosed in a bladder has  
been found useful —

**Cystitis.** see Cullen. It often comes on without  
any evident cause, but often from the use of Cantharides,  
from wounds & injections. The injection of Sac: Saturni:  
has sometimes produced this disorder. It happened to a  
patient of Dr Cullen in the Infirmary of Edinburgh.  
The man is inflammation, hard pulse, the blood sixty &  
yet the patient keeps up & walks about. The fever is not gene-  
rally violent, this inflammation therefore seems to be Chronic.  
Dr Bond informed me that he knew of no inflammation that  
bore or required such frequent bleeding as Cystitis. Besides  
bleeding we must use lenient purges, blisters, demulcents,  
& anodynes. When bleeding has not been used sufficiently it  
terminates in Scurrus ulcers or paralysis. Opening of the



76 The bowels frequently by emollient glisters & when Ischuria  
occurs, drawing off the patients water frequently by the Catheter  
are of great service and towards the end moderate doses  
of Opium.

## Gisteritis. See Cullen. D. D.

has written very handsomely on this disease, it is my advise to read  
his work. It is an inflammation of the womb brought on  
by difficult labour &c. The fever attending this disease, is in  
the beginning Sympocha, then, goes into Typhus hence  
authors differ in the method of cure. In summer or Typhus  
gravior is induced, owing to the Septic Diathesis which  
then prevails. It is of consequence to keep your eye upon  
the prevailing Epidemics of the season. When this disease  
occurs in the season of inflammatory diathesis, the fever com-  
monly lasts bleeding 3, or 4, times: but if it occurs in the  
season for Intermitents you must be very cautious how you  
bleed. Patients especially women after lying in are very  
averse to bleeding, but here you must be firm. Emollient  
glisters & topical applications are useful, stimulents & counter-  
actions & emollient cataplasms to the abdomen are serviceable.



77  
Rheumatismus. in Cullen. It is Idiopathic or  
Symptomatic. The former again is divided into Chronic  
Acute. The cure of the Acute consists 1<sup>st</sup> in bleeding copiously  
as it is an inflammatory disease 2<sup>d</sup> Calomel or mercur  
ial ointment, being applied to the joint affected. 3<sup>d</sup>  
Hamilton in one of the volumes of the medical commentaries  
has published a treatise on the use of Calomel in all kinds of in  
flammation, but I read it before I saw his piece. In inflammatory  
symptoms as fever bleeding is the chief remedy; venient phages  
blisters, topical bleedings, Calomel given in the quantity  
of ℥ss IV. ℥ss continued with Opium also with Antem  
Emetic. In this case Blisters act as evacuations. The Chronic  
Rheumatism is accurately described by Cullen in his  
Arthrodinia. The cure is different from the acute. The  
great Desideratum is to restore the perspiration 1<sup>st</sup> by  
Kermel mixts 2<sup>d</sup> by the warm & cold baths 3<sup>d</sup> Stimulents  
drinks, as sasaparilla, which is a fragrant, aromatic  
and stimulating drink. The volatile tincture of Guaiacum  
has been used with much advantage. For this effect  
it



70. it may be given from a tea-spoonful three  
a day. It drains of different kinds as Pus, uric acid and the  
actual cauter. 5. Salivation, few instances of Chronic  
Rheumatism resist a salivation. 6. when all these  
fail, a warm climate will be service, to which the patient  
should be confined for 3, or 4 weeks, if we wish to cure the  
disease radically. This acts not only by the exercise of  
sailing but by the warmth increasing the perspiration.  
With regard to exercise riding on horseback is absolutely  
injurious, for when exercised, the joints most affected are  
not exercised, therefore it must be forbidden. A remark, that  
I have made, that is not mentioned by authors, is, that  
this disease affects old soldiers & officers, especially owing  
to their intemperance, the frequent change from heat  
to cold, but principally the former. The symptomatic  
species of Rheumatism are very numerous. The female  
constitution in pregnancy is more disposed to infla-  
matory diseases than at any other time. This arises  
from the irritation occasioned by the distention of the  
uterus. Rheumatisms are more violent here than at any  
other time

Caontalgia



*Odontalgia* or Tooth-ach. Causes of the Teeth  
 from effusion arises in this manner: A Rheumatism seizes  
 the jaw which extends to the teeth & renders them ever after  
 liable to a return of this disorder. My reasons for supposing  
 this are the following. In the Torrid & Frigid Zones, the tooth  
 ach and all other inflammatory diseases are scarcely ever  
 found. It is only in intemperate climates where change  
 from heat to cold are sudden that inflammatory com-  
 plaints are prevalent. There is another cause of this  
 disease *Viz.* Scrophula but this acts only by producing  
 Rheumatism. Where the tooth is much decayed, the best  
 method is to extract it, but if it is nearly sound the disease  
 may be prevented, by stopping up the hollow of the  
 tooth with tin-foil or gold leaf or burning the nerve  
 with a hot smiting needle. The cure of the toothach  
 consists in bleeding, blistering, purging, & opiates.  
 The Rheumatism of the jaw is prevented by pro-  
 ducing an equality of heat, as to keep the teeth in  
 the same temperature as it were. The French always  
 sleep with a woolen night cap, & they are observed to  
 never



80. Hence the best teeth of my people. In the day time  
the exertion of the system is generally sufficient to prevent  
any ill consequence from the cold: but at night  
the system is relaxed & consequently more liable to be  
affected. — *Odontalgia* *graniderum* occurs  
frequently from the plethoric state of their system, which  
renders them more liable to all kinds of inflammatory  
diseases. It is so frequently an attendant on pregnancy  
that women sometimes determine this circumstance  
by its appearance. In some cases it appears before  
the nausea. Dr. Hunter supposes that to obviate the  
effects of Plethora, for which, nature has wisely instituted  
this sickness: thus, lessening the ingesta, by giving  
the patient a dislike for food for three or four days.  
There seems indeed to be a probability in this conjecture.  
A mode of replacing teeth has lately been attempted  
in this country. A sound tooth is taken from another  
person & put into the socket from whence the decayed  
tooth had been drawn. The tooth introduced is a piece  
of dead matter & no circulation ever takes place in it.  
This



This we prove from the tooth at its root, being always <sup>of</sup>  
found in Torb, yeens, when it falls out, which it certainly  
will do, when spongy & decayed. That disease which  
frequently happens in consequence of replacing teeth, is  
not venereal, but as Dr. Hunter supposes is produced  
from irritation, occasioned by the putrefaction of the  
teeth newly set in. This putrefaction arises from the custom  
of putting in fresh teeth. Hence it is probable that dry teeth  
would remain as firm & last much longer, for we see that  
a dry post set in the ground will not rot so fast as a  
green one. A dentist of this city put a peg of wood into  
the jaw of a dog, & found that it became as firmly  
fixed as any tooth.

*Podagra* in Cullen. It is divided into 4 Species  
viz. the regular, atonic, retrograde & ulcerating. See  
Cullen's first lines, also consult Sydenham on this  
disease, & Warner's treatise on the gout. Thise M. Warner  
was a clergyman & from being affected with this disease  
was led to study it, showing & reduced himself published  
his remarks. His theory is absurd. Whence



Whenever it is difficult to discern between Gout & Rheumatism, & affections of the stomach here preceded, you may affirm it to be the Gout. These are pathognomonic symptoms.

The Gout is an hereditary disease and does not depend on morbid matter, but a peculiar conformation. When this is strong, it sometimes occurs as early as 5 or 6 years of age, but most commonly 15 or 16. When the hereditary disposition is weak, high living will bring it on, tho it might not have otherwise occurred. It sometimes passes a son and seizes a grandson. This may arise from the son's having resembled his Mother more than his father, or from his having lived very temperately, which subdued the hereditary disposition or from the Grandson's having lived intemperately. There are instances of its attacking women who lived intemperately.

The Gout counteracts all diseases, & attacks all places and parts of the body. I once observed this complaint in the case of a Colic. Adams. Sir James Taylor remarks that he had seen an Arthritic



Arthritic Salivation very copious. It seizes the <sup>83.</sup>  
head, throat, breast, & stomach; also the kidneys &  
Penis producing a Gonorrhoea benigna; Spasmodic  
Pneumonia Pleuritic symptoms, vomiting  
& Nephritis attend; also the uterus & the bladder are affected  
producing what the French call Catarrh of the  
bladder. It affects the rectum producing piles, with  
great pain. I have seen a fit of piles as certainly owing  
to gout as ever I saw vomiting or head-ach. A gentle-  
man had this disorder from intemperance, & it is  
remarkable that if he sat any time in a room with a large  
company, & where candles were burning he was seized  
with almost acute pain in the rectum, & was obliged instan-  
tly to leave the room, & when he got in to the fresh air  
it left him. There is an instance of the sedative  
effect of dephlogisticated air. A very frequent disease  
which it produces is a diarrhoea. I believe, that  
that when a diarrhoea continues very obstinate  
through life, it is an Arthritic complaint which by  
habits of intemperance, is brought on the bowels without  
affecting the feet. It is a maxim in all chronic



Of chronic diseases of children, where the cause is not evident to suspect worms; in all chronic complaints of women to suspect the uterus, and in men to suspect the gout, especially if the causes capable of producing it have preceded. Dumb Gout is a swelling of the lower extremities, without pain, the edematous knee; it commonly goes off about the same time that a fit of the irregular gout does. Its appearance is sometimes alarming. Is there a radical cure for the gout? It may be cured radically, except it be of the chronic species, which is not to be radically cured. The cure is obtained by abstaining from acts of intemperance, & confining the patient to a milk & vegetable diet, & by labour to prevent plethora. The reason why the gout is so seldom cured, is that the person afflicted with it, will not be restricted in, or obliged to change his method of living.

Treatment of the Fit. His imp-



impossible ever to find out a medicine that will  
 radically cure the gout. Medicine may palliate but  
 cannot cure it. The Duke of Portland's powder was cele-  
 brated as a cure, & by its stimulating quality, it seemed  
 to have this effect, but every one who used it died afterwards  
 with Apoplexy, palsy &c. **Tonic gout.** During  
 the fit of this species of gout it is possible to keep the pati-  
 ent, & it is wrong for a physician to turn his back on  
 such a person, as for that person to refuse the aid of medicine.  
 Should there be great diathesis, you may bleed. This was  
 Sir James Fag's remedy by which he cured a gout as  
 certainly & as suddenly as you cure a Pleurisy. We  
 must use this remedy cautiously only in the tonic species  
 of young persons. It is gotten into disrepute from being  
 used from being used indiscriminately by Sir James Fag.  
 Lenient & gentle purges are proper to take off the inflam-  
 matory diathesis. Sulphur is supposed to be the best  
 remedy in this species. But this blisters are very proper also.  
 Dr. Chalmers of South Carolina was afflicted with the  
 gout & used to cure himself by applying a blister to the



Ob. The part affected. From this I learned the use of them  
he was seldom confined above 48 hours with it. They  
should only be used where the gout does not shew a  
retrocedent disposition. When the patient will not  
submit to blisters, the Col. Alk. should be applied to the  
limb, Opium may also be used. The Col. Alk. is apt to  
produce the retrocedent gout. It is supposed from some ex-  
periments that cold may be of service from the ana-  
logy of Gout to other inflammations. This is Dr.  
Small's opinion.

*Tonic Gout.* Treatment of the Fit. When it  
affects the stomach and bowels, we must use strong stimu-  
lents, as wine Col. Alk. porter and Opium. Porter is  
excellent when puking attends. A gentleman who had  
a vomiting which resisted blisters, Opium & many other remedies  
and had continued 48 hours was cured by porter. The  
treatment of the retrograde & wandering species is the same.  
If it attacks the head, the remedy for a palsy is to be  
used; if the stomach wine, Col. Alk. spirits, porter & Opium.  
Dr. Small says that in the Tonic Gout, if



of a vomit be given as soon as the first symptoms <sup>of</sup>  
appear it seldom fails of removing the disease, of this  
we have no experience, as a physician is seldom called  
soon enough. After 40 years we must only hesitate.  
It is highly improper to change the mode of living  
after this period, except under certain circumstances:  
as when their ancestors have been long lived, or there  
appears to be a great vigour of constitution, for they  
either die of Consumptions Palsies or Apoplexies.  
We may restrain the diet & make it moderate, but by  
no means allow one. When we cannot make people  
temperate, we must endeavour to prescribe the drink  
which they be indulged in. Madeira or Sherry  
wine is best to produce the gout, then weak acid or  
red wines, which contain much acid (and little spirit)  
capable of being evolved by the stomach. Cyder is a very  
improper drink but it is rendered less so by quenching  
red hot iron frequently in, by which part of the iron is  
calm'd & dissolved by the cider. Wild fowls and animals of  
all kinds are more easy of digestion than some <sup>and</sup>



80. and full grown animals more than young. Let us  
endeavour to prevail on them to use boiled meat which  
stimulates less than roasted & is more easily digested. Let  
us keep up perspiration by steam, for in so the gout  
occurs less frequently in warm than in cold climates  
and in summer than in winter. Allow all recommended  
exercise, that kind which calls the affected muscles more  
into action, hence the benefit of walking; riding except  
in cases of Stonic Gout is rather hurtful. Walking  
should not be used to excess, as to fatigue, moderate  
exercise strengthens, while too much debilitates.

## Arthropodosis. Diff. in Cullen

This disease has been called the Rheumatism, terminating  
in an abscess. It does not yield to mercury or bark, or  
even opium. The two cases under my care, which ter-  
minated favourably, was cured by a plant which  
grows spontaneously thro' this state called here Thorough-  
wort, & in south Carolina Persicaria, because the stalk  
perforates the leaves —

Order.



Order 3<sup>d</sup> *Ecanthemata* Diff<sup>n</sup> see Cullen

*Variola* or Small Pox. Diff<sup>n</sup> see Cullen

This disease comes on with a pain in the pit of the stomach, vomiting and a pain in the back, which is more acute than in any other disease. The Eruption begins on the third day and ends on the 5<sup>th</sup> in the distinct; but in the confluent it frequently begins on the 5<sup>th</sup> day and is always dangerous. About the 6<sup>th</sup> or 7<sup>th</sup> day the eruption begins to suppurate and dry, but when there are very few, they dry sooner, and that sometimes without pitting at all. The small pox are either distinct or confluent. Sydenham & Willany have written accurately on this disease. Is it not feasible to discuss the small pox before the eruption? Dr. Boerhaave & Willany thought so, & said that mercury and Antimony would have this effect. When this disease comes on with Synocha, the remedies are bleeding, purging, vomiting & sweating, by this means reducing the patient as low as is consistent with life. Thus in some cases the disease is rendered mild, when, if it had been omitted, the



90. The disease would have probably been confluent & have carried off the patient. The fever accompanying this disease is either Synocha, Typhus mitior or Gravis you must therefore regulate your practice accordingly. In some cases of distinct small pox, Pneumonia comes on which must be treated as if it was idiopathic.

Pneumonia sometimes occurs when the eruption begins to turn or suppurate, in this case Catamel given in such quantity as to produce a will be of service. Previous to the eruption the more cold air the better, but after the eruption when Pneumonia occurs it is rather hurtful, however it may be used with advantage when the Typhus appears. It is a good custom to spend pustules to prevent the ~~fever~~ which the disease commonly brings. Purgings is serviceable towards the end of the disease, then being then a disposition to eruption, when 3, or 4 gentle purges will carry off or remove. For the method of inoculating I refer you to Dr. Cullen. Varicella Dr. Cullen. This is an insignificant disease and deserves nothing to be said on it. I refer you to Dr. Cullen.



Subeola. in bullis Diff. In this disease  
the Synocha & Catarrh occur more frequently in  
winter, than in summer. It is said sometimes to be  
accompanied with a Typhus. When Synocha, Catarrh  
Pneumonia occur in the measles they are to be treated  
as if they were Idiopathic, by bleeding purging &c.  
The treatment of this disease with respect to cooling  
is contrary to that of the small pox, so as catarrh &  
occur here cold is always hurtful, a moderately warm  
regimen therefore is preferable. This disease if neglect-  
ed frequently terminates in a Phthisis. If the pulse  
be hard, bleeding & a vegetable diet continued for 10,  
days will be necessary: but when the disease appears  
with more Catarrh than usual, it may be necessary  
to continue it as long as 10 weeks. The body should  
be kept moderately warm during this time.  
After the disease is cured purges are always improper  
for this being more than a cutaneous disease, it  
always affects the lungs. Who would give Drastic



92 Drastic Purges in a Mithesis. Porrigentale  
aliment, the violence of the disease may be increased,  
as it lessens the inflammatory diathesis, and I count  
the determination to the lungs. Inoculation in the  
disease is of no advantage. It may be performed by  
putting a piece of thread in the tears & applying it  
as in the small pox.

Scarlatina Def<sup>n</sup> see Cullen. In this country  
this disease is not always Synocha, it is more frequen-  
tly a Typhus mitior & sometimes gravior. It is either  
simple without any other affection, or attended with  
eruptions of the fauces. Sydenham has accurately  
described this disease, when simple or unattended with  
eruptions of the fauces. This species occurs but rarely.

Scarlatina Anginosa, or Cynan-  
chica of Cullen is more common. This species  
has <sup>been</sup> thought to be the same disease with the Cynanchica  
Maligna but it is a mistake. They certainly may  
be distinguished. Dr. Wetherhill has described them



93.  
Then diseases accurately, he says the eyes in this  
disease are red and shining and in the malignant  
In this the eruptions in the throat are white, in the  
maligna commonly black; in this the breath is hot;  
but not offensive as in the malignant.

Multa desunt.

## Order 4<sup>th</sup> Haemorrhagia —

Def.<sup>n</sup> & Bullens Synopsis. Hemorrhages I have seen  
divided into Active and Passive. The active are occasioned  
by Arterious plethora, & the passive by a venous. The active  
occurs in youth, the passive in the decline of life. From the  
age of 36 to that of 40, ordinarily there is a struggle between  
the arterial & venous systems; that period of life is generally  
attended with diseases. Among which are 1<sup>st</sup> Headach  
which seldom goes off till the Plethora is thrown on the  
veins; 2<sup>d</sup> Diarrhoea occasioned by the Plethora & cured  
by bleeding; 3<sup>d</sup> Piles. The Plethora being thrown on the  
hemorrhoidal veins, this occurs at this period of life often  
than at any other. The Dyspepsia, Hypochondriasis &  
Hysteria are sometimes produced at this time. The



94 The age of puberty. At this time the system undergoes  
a change which is not produced without some diseases,  
as scurvy of the breast & knees, a cold, cough & Plethora  
relieved by bleeding & moderate and moderate  
exercise on horse back. It is of consequence to rescue  
young people from sedentary employments, which  
frequently lay the foundation for the consumption  
and other incurable diseases. So much for general  
descriptions on hemorrhages. We now now to speak  
of general remedies during the paroxysms. The 1.  
then is cold, which must in this case be used in  
such a degree as to become sedative, for a moderate  
degree of cold is a certain stimulus. In battles  
many wounded soldiers owe their lives to being  
left on the ground all night in the cold weather,  
the cold proving as sedative & stopping the flow  
of blood. 2.<sup>d</sup> Next to cold is bleeding which must  
be used with great caution. If the pulse is hard  
and full, bleed, but if the effusion has taken down  
the force of the circulation, bleeding will be further



... 3. Opium. 4 Neutral Salts and an 95.

cently salt called Alum. 5. No lesters have been  
used and applied as near as possible to the point  
from which the blood issues. The blister acts here as  
an evacuant & antispasmodic. When it acts as a  
stimulus, it must be improper. 6. Gentle laxatives  
will be proper to lessen the tension, & determine as much  
as possible the force of the circulation from the bleeding  
vessels. How can we prevent Hemorrhages?

They are 1<sup>st</sup> prevented by abstinence, particularly  
from that aliment which produces most blood.

2<sup>d</sup> By using that kind of vegetable diet, which  
contains the least nourishment. Vegetable sub-  
stances are said to be nutritious in proportion  
1<sup>st</sup> To the quantity of sugar they contain 2<sup>d</sup> to the  
quant<sup>y</sup> of oil 3<sup>d</sup> To the quant<sup>y</sup> of Mucilage.

3<sup>d</sup> They are prevented by constant & moderate  
exercise which gives tone to the system. For Pletho-  
ra depends upon relaxation, hence the heavy  
labourious country men is not plethoric  
Darti-



Particular Hemorrhage  
 Epistaxis. Def<sup>n</sup> in Cullen. Before we  
 enter upon this subject, I would beg leave to remark  
 that there are certain persons subject to cr. Hemorrhagic  
 Diathesis. When this is the case, the cold bath & leech  
 have been used with advantage. Epistaxis is either  
 Idiopathic or Symptomatic, and occurs in the adult  
 as well as in the young.

CURE. 1<sup>st</sup> This consists in trying cold applied  
 to the neck, or to the scrotum which is much more sen-  
 sible to the effects of cold & dipping the scrotum in cold  
 water hardly ever fails to stop the bleeding.

Washing the face will sometimes cure it, but if it  
 has not this effect immediately it commonly acts as  
 a stimulus & thus increases the discharge. 2<sup>d</sup> When  
 these remedies fail we must introduce dry plugs of  
 Linen or lint, so as to completely stop the nostril.  
 This plug must remain an hour or more & sometimes  
 for two or three days, & if it should slip out, we should  
 introduce a dry one, for in the degree the plug depends



the success. Common salt has been used with 97  
advantage in Epistaxis. in the manner hereafter  
to be mentioned, under the cure of Hemoptysis. But  
it is absolutely necessary that the patient should not  
sit up.

**Hemoptisis.** Def<sup>n</sup>. see buttons Synopsis.

Its species Symptomatic or Idiopathic. see buttons Synopsis.

A spilling of blood occurring in consumptions is commonly  
a fatal symptom. A suppression of any usual discharge  
sometimes produces an Hemoptisis. The symptomatic  
arises from Catarrh, Measles, Smallpox &c. In the  
smallpox it is an alarming symptom indeed. The cure  
consists in bleeding, Opiales, Acids, & avoiding violent  
exercises especially lifting weights. Bleeding is general-  
ly absolutely necessary. After bleeding opiales, then  
acids, as you hasten with vinegar. Rest of great conse-  
quence should be strictly enjoyed. A remedy has  
been lately discovered for the Hemoptisis, which renders  
the most of the other necessary, is Common Salt.

which



98. which to be sure is the last that would occur to a  
regular practitioner & yet I have heard and known of  
more than 100. cases in which it has proved serviceable.  
The dose is from a tea to a table spoonful, which generally  
cures the disease, but should be repeated in 3 or 4 days  
after to prevent the return of it. The salt produces  
thirst, a sense of burning heat in the fauces, & sickness of  
stomach. Those persons who use their lungs much, as  
the Gunners who sing much. Players, Lawyers and  
watch men are seldom affected with this complaint.  
This Hemorrhage generally occurs in debilitated humors  
and at a time when the lungs are in a passive state  
as walking, sitting, lying &c. Hence may we not  
suppose that common salt, by irritating the mouth  
and oesophagus, communicates a stimulus to the bleed-  
ing vessels & thus prevents the future effusion? But the  
use of common salt should not supersede bleed-  
ing and the other remedies. —

Pthysis



# Phthisis Pulmonalis—

99

Def<sup>n</sup> in Cullen's Synopsis. It arises from hemorrhages  
able. Abscess, asthma, catarrh, or tubercles. Tubercles in  
generally most cases arise from Scrophula and are ge-  
nerally incurable. It has been supposed that in  
Great Britain 22000 die of this disease. The  
common remedies are 1<sup>st</sup> bleeding while the  
pulse is hard or the blood viscid. 2<sup>d</sup> A milk & vegetable  
diet 3<sup>d</sup> avoiding all kinds of irritation 4<sup>th</sup> deter-  
mining to the surface of the body 5<sup>th</sup> Making  
artificial drains, & by means of Issues and blisters  
taking of the determination to the lungs 6<sup>th</sup> An  
agreeable atmosphere. The climate of Barbadoes  
is esteemed favourable to consumptive habits. Lisbon  
has been found to be unfavourable. These are the  
common remedies. A fact that may direct  
your attention to useful observation on this sub-  
ject is, 1<sup>st</sup> It is unknown among the Indians  
in their natural state. 2<sup>d</sup> It is scarcely known  
among



100. among the Inhabitants whose lives most  
nearly approach that of Savages. The life of the  
first settlers of this country comes nearest that of  
the Indians. The consumption, it is observed, is  
very rarely among them. 3<sup>d</sup> It is less common  
in country places than in cities, and increases  
with intemperance, and sedentary modes of life.  
4<sup>th</sup> Ship-shouers carpenters, smiths &c. whose busi-  
ness requires exercise in open air & whose diet  
is not generally very luxurious, seldom have  
consumptions. 5<sup>th</sup> Women, especially those who  
lead a sedentary life are more liable to consump-  
tions than men. From these facts, we may hope to  
prevent consumptions, by desisting from the dissolute  
manner of life. I shall examine here only a few  
of the <sup>variety of</sup> remedies, which, at one time or other have  
been famous. For this so dreadful and fatal disease  
and endeavour to show that the efficacy of the  
most of them depends on the exercise and air  
which



which successfully accompanied the use of them.

1<sup>st</sup> Sea voyages have sometimes proved beneficial, because of the almost constant exercise.

2<sup>nd</sup> Change of climate has been recommended, but I do not remember to have heard of its curing Con-

sumptions, unless accompanied with travelling in the open air. 3<sup>rd</sup> Journeys have often performed

cures, but chiefly when long and accompanied with difficulty, which rouses the strength of mind and body. 4<sup>th</sup> Vomits of nauseating medicines

have been often recommended: but I do not remember an instance of their having cured when unaccom-

panied with exercise. 5<sup>th</sup> Bleeding has often relieved, but it is only by taking off the inflamma-

tory diathesis, which exercise would have done much better. 6<sup>th</sup> Vegetable bitters and stimulating

gums have been of service, but it was when there was great debility. 7<sup>th</sup> A plentiful perspiration

excited by any means has often prolonged life, but



102. but this cannot be properly kept up, without  
exercise and that in wholesome air. Of these  
Letons, Issues become in like manner deemed  
to carry off the redundant fluid, which ought  
to have been dissipated by moderate exercise.  
Of swinging acts in the same way, and is thought  
a gentle and agreeable exercise. It may substitute for exercise.  
From all these facts, it is evident, that the  
remedies for consumptions must be sought  
for in the exertions which throw off most plentifully  
= fully. 1<sup>st</sup> I have known men cured by the hard-  
= ship of a military life 2<sup>d</sup> During the war before  
last a Mr. Lawns was carried away by the  
Indians & kept by them for a considerable time.  
He was dragged from home when ill of a consump-  
= tion; but the simple and rough living of  
the Indians, which he was obliged to submit  
to, cured him; nor did ever the disease return.  
These facts are sufficient to establish the utility  
of more laborious exercises which I have enumerated.



Where Brooks, Woods &c. are wanting,  
 substitutes may be determined for them, and Dr  
 Sydenham pronounced riding on horse back  
 as certain a cure for consumption as bark for the  
 Intermittent which I do as certainly believe as  
 that inflammatory fevers are more scarce now,  
 than when Sydenham wrote

1. Agriculture, if at the same time accompanied  
 with farmers diet, and hard work, is useful.

2. Such occupations as oblige long exercise in  
 the open air. The more feeble a constitution is, the  
 more laborious should be the way of life to prevent  
 this disease. 4<sup>th</sup> Dr Smellie relates a case of the  
 cold bath being efficacious in the cure of consump-  
 tions. I have heard of a similar instance of a  
 negro in the West Indies. We may prolong life  
 by using the debilitating method only.

There is certainly an inflammatory diathesis  
 connected with debility, which prevails more  
 in cities than in the country & in women more



104. more than in men. It happens to arise from  
indirect debility, as it is called. It is the presence  
of this species of inflammatory diathesis, which  
renders consumptions more difficult to cure  
than formerly. It is this that renders riding on  
horse back so ineffectual. If it were possible to regulate  
the tone of the system by a scale I would add that  
the system should be raised to <sup>the</sup> greatest degree of  
tone to cure consumptions.

When inflammatory diathesis <sup>prevails</sup> a vegetable diet  
is proper, but when the disease has passed this  
period, I think from experience meat may be taken  
in a moderate quantity. The leech has been given  
with evident advantage, when there has been a  
total absence of inflammatory diathesis.

There is a man in one of the back counties of  
this state, who, it is said, is famous for curing ~~consumptions~~  
consumptions. His remedies are, lying out of doors,  
with a fire at the patient's feet, and the use of <sup>severe</sup>















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## Practice of Physic Vol. II.

Hæmorrhoids. Diff.<sup>n</sup> of the diff.<sup>n</sup> Species Approximate  
causes of which see Cullen's Practice —

This disease is frequently caused by costiveness; hence  
sedentary people & those who ride much on horse back  
are most frequently troubled with it. Sometimes  
comes on with the symptoms of Pyrexia, & must be  
treated like other active Hemorrhages by bleeding  
and lenient purges, of which sulphur is common  
ly used.

The Butternut pill is a gentle Laxative  
but as it possesses some narcotic powers it is not  
safe to use it any length of time. There are many  
instances of many people dying apoplectic & others  
being seized with palsy from the habitual use  
of this Medicine. Dr. Magaw's remedy for  
relieving costiveness was to make the patient  
every day at a certain hour sit on the clove stool  
by which means the evacuation at that time  
became habitual, & thus the use of all evacuates  
became superseded. A loss is the most improper



2. Laxative Malvern be used, for it frequently is the cause of the disease. To relieve the pains various applications have been used such as equal parts of Opium ground with oil, a Venice treacle plaster. The Unguent. Stramonium which is very proper as having a wonderful property of allaying irritation. In making the ointment it should not be suffered to boil. Tar ointment is a good application. This disease has been cured by an ointment made of white lead & sweet oil in equal quantities applied three or four times a day.

A moderate regulable diet will be proper, because it affords less blood and is more assuaging. When purgatives have been used to bleeding we must suppress it with great caution.

A vomiting of blood from the stomach. There frequently observed to occur in head distensions, & in consequence of accidents, as a blow upon the region of the stomach. A violent shock will sometimes occasion it.



gentlemen whom horse stumbled but  
did not fall was taken with a vomiting of blood  
The remedies are Liquid Laud. & Corn<sup>n</sup> Salt  
which I have once given with success. 3<sup>d</sup> cold water  
taken into the stomach or applied externally.  
I have lately seen great advantage derived from  
the Application of a napkin dipp'd in cold water  
applied to the epigastric region, in the course  
of ten minutes the Hemorrhage ceased. If this  
had failed I would have ordered glysters of cold  
water to be injected. I have had no experience of its effects  
Should thus said Sp. Turbintl. may be given. It may  
appear strange to order stimulants in such a case,  
but if we consider that in passive Hemorrhages  
debility prevails we can easily conceive that stimuli<sup>ts</sup>  
give tone to the vessels of the part and thus stop  
the Hemorrhage, hence in this disease they  
are absolutely necessary.

to abdomen.



4. Menorrhagia Less<sup>n</sup> see Cullen.

Is a common remark that Child bearing takes place only during the Menstruation, but from the authority of Dr Hunter we understand that women often bear children both before and after menstruation. Pregnant women sometimes have the menses, & that monthly during the whole period of gestation — Smelly mentions this hence we should not be surprised at it. It is supposed this evacuation is from the vagina.

Hæmorrhagia Uterina is sometimes connected with tension and sometimes with debility. To in both cases is nearly the same. The first thing to be done is to recommend rest on the back, because in this posture fewer muscles are in action. You can seldom cure a Menorrhagia when the patient continues to walk about. If the patient be of a full habit bleeding is necessary but we meet with few cases which require it.



is an excellent remedy. Dr. Young of  
Edinburgh entertained the highest opinion of Opium  
in this disease. Cold air is also found to be  
excellent. as also cold water; Vinegar likewise  
is serviceable. Flour thrown upon the bleeding  
point has been found to form a Thrombus by  
compressing the blood & absorbing its thin parts.  
Alum may be given with success from X to XX  
grs three times a day. The recurrence of this  
disease depending on Plethora is to be prevented  
by moderate diet & occasional venosuction. At  
first passive, after some time active exercise as  
walking riding &c. When it is connected with  
debility we are to use Tonics, as Bark, steel, Astringents  
exercise & cold bath. Blisters are proper when  
there is a dropping only. They act as evacnants  
The Spasmodics or Tonics. They should be applied to the  
throat, as high up as possible. Ipecacuanha  
has been much & justly recommended in this disease.  
It acts as a tonic. A Reciprocity of conjoint delights



6. Through the investigation of the ramifications  
of friendship is with <sup>part</sup> duty in totality in admittance  
Excursions in the country have been unavailing.  
Keeping up the perspiration by flannel is necessary.  
The Menorrhagia illorata is unfriendly to child  
birth. Most miscarriages are brought on by it. It  
may be alleviated by occasional bleeding. Because  
the habits of pregnant women. Pathetic.  
We are to use bleeding when we cannot persuade  
Take the necessary remedies from VI to VIII  
should be taken away once every month for the  
four or five first of the disease.

Leucorrhoea may be easily distinguished from  
Gonorrhoea by its being accompanied with chronic  
diseases. It is a great enemy to child bearing  
tho it do not always prevent it. As we  
consider it a disease of the whole system, we  
attempt the cure of it by general remedies as  
Bark, Steel, Cold Bath, Exercise, Turpentine &c.  
sometimes the matter is so acrid as to produce  
ulceration 'tis then difficult to distinguish from



Catarrhus Def: su Cullen.

7

There are two species the first from cold the second from contagion. That we are capable of receiving it from cold is certain, but whenever Catarrhs are universal it is presumed that they are from contagion. I have not doubt of its being a contagious disease, than there is of the small pox so great a degree as to extend over the whole continent two or three times. The Influenza of the Italians is the same disease we often find children only affected by it & at other times grown people. There is a species that affects cattle only.

There is an Island in the west of Scotland, to which if a stranger goes from any country whatever within three or four days after his arrival all the Inhabitants are seized with a Catarrh. The fact is related by the Rev. Mr. Cawley. It is supposed to depend on the inhabitants living on very low food, while a stranger from having lived higher had a certain quantity in his perspiration which occasioned irritation & produced this Catarrh. It has been surmised that



8 That men of different countries being suddenly brought together become sickly by the difference of perspiration & breath. This was remarkably intimated in the late war by the camp fever while the army lay at Cambridge Am. 1775.

In the New England troops amounting to 15,000, no such fever was seen. When the armies met at New York from the different states the fever raged with great violence. The Indians know nothing of Catarrhs tho they do of colds.

Respiration is thought to be specific, as dogs constantly distinguish their masters. In an assembly in this city <sup>consisting</sup> of an hundred persons every one of them was seized with a catarrh. This undoubtedly was from contagion. Most Consumptions arise from neglected colds. Dr. Magaw used to say that the plague only was worse than ~~the~~ cold. The patient often suffers much from being able to walk about before he applies to a physician. What is death else than a very great cold? Sleeping is frequently necessary in



in this disease. Gamet never failed of curing himself  
by eating a salad during at bed time. This acted by  
exciting thirst. Demulcent drinks as Flax seed tea  
horum tea, barley water boiled with raisins;  
sugar candy, mild oil with sugar rubbed in it  
have been all found useful. Opium is necessary in  
this disease and should be used as early as possible  
after the usual evacuations of bleeding. ---  
bleeding when other remedies have failed has  
been found useful. Additional warmth is necessary  
in the convalescent state. Cold is certainly  
injurious whenever the lungs are affected. Riding  
on horse back is of service for shaking off the  
humors of this disease. Night air is to be avoided.  
Flannel shirt is of use. Soothing the feet in warm water  
is serviceable. Consumptions generally succeed  
if neglected. ---

Dysentery. Acute, & sublethal. ---

Whether it be Idiopathic or Symptomatic is disputed.  
The fever is supposed to be the primary disease.



10. If it be a primary disease, it often occurs as a symptom  
of a fever called by Sydenham Febris Intermittens.  
In this city it is generally complicated with the intermittent.  
In both cases the cure is the same, therefore 'tis of no  
consequence which it is. If the inflammatory  
diathesis be considerable, bleeding is necessary. Lenient  
purgers are requisite in all cases. Rhubarb is at present  
considered an improper laxative. Sals, Gum. Tart.  
Manna & Castor oil are the most proper. If a disposition  
to spuke appears vomits & purges are by all  
means to be persisted in, whilst the symptoms  
which require them continue. This disease has  
been found more fatal in children of 4, or 5, years  
old than in adults, probably from their unwilling-  
ness to take proper medicines.

The Irritation may be relieved by Opium which  
should be given in every case of Dysentery every  
night. Demulcent drinks are proper, that made  
of harts horn, Gum Arabic &c. Demulcent inject-  
ions with a little Liq. Sars. are serviceable.



11.  
Mutton suet boiled in milk or mutton broth  
in the same way is of use. Plasters on the wrists  
have been found of use in the Febris introversæ of this  
city. They ought to be applied on the 6, or 7, day, if  
the disorder yield not to other remedies. The fever  
attending this disease is of the Remittent or  
Intermittent kind: in which case the bark with  
sugar is an infallible remedy. If a Diarrhea  
occurs it must be treated as we shall direct hereafter.  
Protractions and Paralysis of the upper & sometimes  
of the lower extremities follow this disease. As  
in the Cholera Pictonum of the West Indies.



12 Neuroses in Cullen.

Order II. Comata. Apoplexia in Cullen.

There are different species and degrees of this affection. It is sometimes very profound and accompanied with total loss of reason. In apoplexy there is either an intravascular, or extravascular of blood or serum. That depending on extravasation is beyond the reach of our art. The third species of an apoplexy is not necessarily fatal people have had 12 or 13 fits especially drunkards. Sometimes people die of the first or second fit.

The II species of Apoplexia Sanguinea is the most frequent. The first remedy is copious bleeding. This disease depending on <sup>in</sup>ordinate debility, acts as a stimulant producing full pulse & all the symptoms of inflammatory Diathesis. It is remarkable that the pulse is not so hard here as in acute Inflamm. Diath. The bleeding should be profuse; a vein in each



both arms should be opened & bled every 20 or 20  
 or 30 drops of blood. To have been taken in some cases  
 with advantage; the pulse must be our guide,  
 A strict posture; loose garments, Astringent Glysters,  
 Strong Cathartics, Relictus to the neck, Pediluvium  
 Stimulating Cataplasms of mustard seed applied  
 to the feet are found of use.

Dr. Hoffman recommends emetics in this case.

II. Species *Serosa* will sometimes occur in  
 tropical patients. Remedies as above, bleed with  
 caution. - stimulate with spirit.

### III. Species *Hydrocephalica*

This disease is supposed to depend on Inflammation  
 of the brain. It has been reported in the Periodical  
 papers of London that it has been cured by the use  
 of Mercury. It generally proves mortal several  
 ounces of sweated has been found in the brain of  
 those who died of this disease.

### IV. Species *Arabiliaria* seldom met.



V Species Traumatica This is to be treated in the same manner as the Sanguineous.  
 VI ditto Venenata. The most frequent cause is strong drink. This species of apoplexy is present when a person is dead drunk. wine does it. Cold water & fear are said to be effectual remedies. Another frequent cause of this species of apoplexy is mercurial air discharged from fermenting liquors. Buckets of cold water thrown upon the face are useful. Blisters or a red hot iron applied to the head are said to be of advantage. Wine cellars or wells long shut up are dangerous. The same disease from Insolation is to be cured by cold water & fear. Apoplexy from cold belongs to this species. Friction with snow & flannel are of service, approaching too near the fire is injurious.

VII. Apoplexia Mentalis. caused by anger is cured by bleeding blisters. That from joy by cold air and water.



Spoplexia Cataleptica. Cullen never saw it.

Suffocata This takes place in persons who are hanged or drowned. If there be any cure 'tis by wrapping the body in a blanket and rubbing it, inflating the lungs, injecting in to the intestines. As soon as patient can swallow volatiles & stimulents must be exhibited. Bleeding must not be practised untill the pulse has recovered its full vigour.

Dr. Franklin says he has slept agreeably when in a bath. Why does the body sink being specifically lighter than water? Because the patient dies in fear which lessens the bulk of the body & thereby renders it specifically heavier.

The Symptomatic species of Apoplexy are.

1 Febri's Intermittens. This is very frequent in this climate, & is occasioned by the exuding & redative power of the Chiasmata, the remote cause of Mors Fevers. A lady who was again taken with Apoplexy



16. Apoplexy was cured by bark.

2 Febris continua & eruptive fevers begin with apoplexy.

3 Epilepsia often assumes the appearance of apop.

4 Mysteria. counterfeits almost all diseases & among the rest Apoplexia.

5. Podagra. Gout frequently puts on the appearance of apoplexy & perhaps more so than any other disease.

6. Verus. sometimes produces Apopl. as almost all disorders of the human body

7. Tetania & Scorbut. Scurvy & scurvy sometimes produce apopl. Those who die of Tetania die apoplectic

Prophylaxis or method of preventing the same is necessary. Meninges sleeping, giddiness & acute pain in the head usually precede it. Most risings are improper. Lament surges are of



of the utmost consequence. Exercise is inadvisable.  
All the patients cloaths should be loose. Sleeping  
on the back is improper. Issues & Quaterns are serviceable.  
Restoring suppressed evacuations <sup>are</sup> of use.

Paralysis Definition & see Cullen.

Hemiplegica, is sometimes occasioned by the Spina Bifida.

Paraplegica is generally incurable.

Venenectomia From poisons. The causes are the  
same here as in Apoplexy. Want of motility or excitement  
in the nervous ~~system~~ power. In palsies from effusion  
the pulse is always full. The Remedies are Venesection  
in a large quantity; purges. Aloes have been found  
of peculiar efficacy by stimulating the rectum and  
thus taking off the irritation from the brain.

Blisters applied to the neck have proved serviceable.

Effusion in the head is chiefly distinguished  
from the want of motility in the limbs.

The palsy from want of motility occurs from cold  
or Rheumatism sometimes.

When the nervous System is affected Electricity has  
been found of use. Hot & cold baths immediately <sup>after</sup>



18. after each other. & Emollients. as mustard  
stinging with rubbers Plasters &c. Frictions with  
the flesh brush or flannels. Weights appended to  
particular parts affected have been useful D<sup>r</sup> Cullen  
related a girl affected with this complaint to  
put her arm into very hot water, then to lift  
a small weight, by degrees a heavier by  
which judicious method she was relieved  
Prophylaxis the same as in Apoplexy  
TREMOR def<sup>n</sup> &c see Cullen.

This disease is connected with palsy. There are two  
species from weakness palsy & convulsions  
This produced by affections of the mind  
as Fear, Joy, Anger, &c. a frequent cause is strong  
drink. Painters, Metallurgists are affected by it  
This supposed to arise from the immoderate  
use of Tea, Coffee Tobacco &c Sir J. Pringle  
was affected with tumor in consequence of  
using much Suet cured by leaving it off.  
Remedies of tumor are 1 To avoid the  
cause. To use Tonics. Blisters, Steel & particularly cold



# Syncope.

*Adynamia seu Cullen.*

Syncope, the motion of the heart diminished.  
Cullen has properly distinguished between Syn.  
which depends on the heart & that which depends  
on the brain. The first arises from a fault of the  
heart, and is beyond the reach of medicine.  
The latter from Evacuations, Fatigue, Passions  
of the mind, particular odors, particular sights.  
Remedies, a recumbent posture, cold water applied  
to the temples, & Friction, when the patient can  
drink. To prevent this disposition Tonic Med.  
the cold bath is effectual. Resolution would cure  
all species of syncope that arise from Antipathy.

*Dyspepsia seu Cullen.*

This is a frequent disease it is either Idiopathic or  
Symptomatic. The symptomatic is either from  
a disease of the stomach or the other parts of the  
body. The stomach has been very justly called the



20 The Index of the Nervous system, scarcely  
any part of the system can suffer without  
affecting the stomach: Not only the affections  
of the body but those of the mind affect it  
likewise, as Anger Grief &c producing some  
of the symptoms of dyspepsia. Very warm  
or cold aliments difficult digestion affects  
it in a particular manner

Cure. Avoid all the remote causes particularly  
spirits, administer Camomile tea or any  
other better, common weak tea will do.  
Vomits of atonic nature as Col. Alk & Theriac.  
Laxatives, Tonics likewise as Rhubarb Salves  
Tonic medicines as Camomile, stevia, lobelia  
Contra Emulics, raw onions, Elix Vit.  
Aromatics. Exercise, animal diet, not subject  
to acetous fermentation, are of use  
Umbelliferous are the most proper ointments  
These give rise to the stomach & prevent nausea.



## Hypochondriasis

Hypochondria is a disease concerning the proximate cause of which physicians are not agreed. The patient may be relieved by gentle Laxatives, Opium, Porter, Bleeding just before going to sea & taking a gentle purge. Lying with the head lower than the heels has been found to cure it. A Draught of salt water likewise.

## Hypochondriasis. see Cullen.

In order to understand this disease we must explain a few terms

Sensibility is the power of feeling without motion or a power inherent in the body of conveying sensation to the Brain.

Irritability is impulsion & motion combined. This is also called contractility.

Diseases sometimes arise from excess of sensibility sometimes from Irritability sometimes from both called Motility.

When a defect of sensibility takes place <sup>{ Stupor</sup> it is called  
When a defect of irritability Torpor <sup>of both</sup> Inertia.



22. The Alimentary Canal is the principal seat of this disorder as well as of Dyspepsia but to constitute the former; but to constitute the former a lowering of spirits must accompany the affection of the alimentary canal. It happens in a variety of ways as Costiveness, which arises from Torpor of the intestines; as in Insensibility of the Intellectual Faculties. Many persons may be exposed to cold Heats &c without being sensibly affected by them.

Hypochondriasis shows itself in a difficulty to vomit, the stomach heaving of the Torpor of the Intestines. A Diarrhoea sometimes occurs: but Costiveness more generally. Sometimes less than natural. This often confounds with the Hysteria. They are thus distinguished

1. Men are more subject to this disease than women.
  2. More common in winter than summer. In cold than warm climates.
  3. Peculiar to Sedentary employments.
- 4<sup>th</sup> No Globus Hystericus ever accompanies this disease but it is one of the most Pathognomonic symptoms of Hysteria. The other symptoms are in common with both.



23

*Dyspepsia* you have diseases of the stomach without  
lowness of spirits: but here the diseases of the stomach  
are accompanied with lowness of spirits. The Proximate  
cause is a defect of motility. Hypochondriasis occurs  
in melancholic temperaments, Old Men, Students  
especially of Physic & Divinity. When exercise is not duly  
employed; 'tis sometimes with greenness.

Cure nearly the same as in *Dyspepsia*, warm drinks  
and leeches are pernicious. Calomel as being an  
universal stimulant is proper, it should be given  
in such quantity as to produce a salivation.  
Long journeys have been serviceable. Anything  
which tends to support a connection of ideas  
in the present thoughtful situation should be  
removed. Pursuits which interest the passions  
are of consequence.



**Chlorosis.** 'Tis a female disease. Sometimes proceeds from an excessive retention. I say Discharge of the menses as well as retention.

**Remedies.** The same as in Dyspepsia but here Bleed & still are of more consequence also the cold bath —

**Spasmi** see Letter —

Spasms are either Tonic or Clonic. Tonic not alternating with relaxation. Clonic is that which alternates with relaxation. We must say a few words on nervous tension which may exist without Arterial Tension. There is a certain degree of nervous tension necessary to health, depending 1<sup>st</sup> On original stamina 2<sup>d</sup> On the tension of the arterial system 3<sup>d</sup> On the degree of fullness & tension of the alimentary canal and organs of generation 4<sup>th</sup> On exercise in a certain degree 5<sup>th</sup> On a certain degree of cold —



Heat and the want of exercise produce Sensibility  
Irritability & Motility which are the results of a due  
degree of tension.

Tetanus see Cullen.

This disease is supposed to depend upon direct debility  
Cure. must be attempted by tonic remedies as  
Wine, Whisky, large quantities Cold Bath, sedation.

Tremor Nervosum may be prevented by purging  
of the micrium by a little Rhubarb & Magnesia  
Convulsio see Cullen.

This disorder is supposed to proceed from Atonia.  
Opium is the only remedy during the fit. The  
disposition is to be overcome by Exercise the cold  
bath. When Rhetorica prevails we bleed.

Chorea see Cullen.

This occurs between the 10 & 14 years. it may be  
cured by worm medicines. Steel powders Mark  
cold bath &c

Raphania. Diffin see Cullen.

Cause cure &c see ditto



26. Epilepsia. Des<sup>n</sup> in Cullen.

Is Idiopathic or Symptomatic, 'tis sometimes mesenteric  
or Hysteria.

Its proximate cause is mobility. Remedies are usually Tonics of every kind, astringents, bitter vegetables. *Cuprum Ammoniac, Zinc, &c.* While visiting, Zinc has been said to produce a perfect cure. Leatons where plethora exists, sudden fear, change of climate & seduction. This acts by giving tone to the entire system & of course to the nervous which takes off the disposition to Epilepsy. A Quack is said to have cured this disease by giving the blood of a land Tortoise warm for three morning successively —

Palpitatio in leucon

When Idiopathic is incurable: when Symptomatic  
it yields to the remedies proper for the disease of which  
it is a symptom as Gout, Hysteria &c

Asthma sec. Cullen.

It is divided into humid and spasmodic. In every  
case of asthma there is spasm however it may arise.



27.  
Expectoration in general is in proportion to the defluxion  
on the lungs.

Cure, in all Tricipathic Species should be the same.

Bleeding ought to be the first remedy. A nose is often

bleeding in the Thorax it is an alarming symptom it yields

to bleeding as do other symptoms equally alarming.

Uomits are next to bleeding. after these sedatives as

Opium, Pectorals are given squills are the most proper

Garlic, Gum Ammoniac are proper also. Adusters

are most excellent. Leetons & Issues to prevent its

return. Consumptive women ought to suck their own

children otherwise the Pusshora which should be taken

off by sucking falls upon the lungs. 'Tis well known

that a certain quantity of moisture is necessary in

the atmosphere for the well being of all animals.

in such proportion as that quantity is increased or

diminished in the same proportion will those

troubled with this disease be affected. Hard beds are

found favourable to asthmatic people. Hence is necessary

respect should be paid to diet, indigestible food & small liquors avoided.



20. *Dyspnea* in Cullen. Cure the same as that of Asthma

*Pertussis.* in Cullen

This is a contagious disease and certainly a  
spasmodic one. The seat of the spasm is supposed to  
be in the Trachea or Bronchia also in the stomach  
according to some. There is generally inflammation  
Six weeks are supposed to be its ordinary duration: yet  
it sometimes lasts three months. Adults are  
sometimes affected with it. This disease sometimes  
ends in a mortal consumption

Cure. The first effectual remedy is bleeding when the  
inflammatory diathesis takes place. Vomits Erym  
Icil. & Purgant. or Ten. Em. repeated three or four times a week.  
Gentle laxatives as Rhub. Scalon. Antispas. Ol. Succ  
Gentle. Asafetida. Opium. 10 or 12 drops of the tincture  
of asafetida given 3 or 4 times a day. with or without  
Fear has been of service ~~counteracted~~ likewise  
A pitch plaster between the shoulders fastened by  
draughts changed every fortnight is of use. Change of air.



## Dysuria in Cullen.

This often occurs as a symptom of Dysuria, not always  
 A quantity of limpid water is often discharged without pain  
 a cure. is affected by blisters & common Stomachics

## Colica in Cullen

Women are more subject to this disease than men.

Cure in plethoric habits bleeding, as the intestines are  
 sometimes inflamed. This sometimes cures As it takes  
 of tension from the whole system, so it does from the  
 bowels. Gentle laxatives Crem. Tar. in the dose of ʒss or ʒi  
 3 or 4 times a day, neutral salts in small doses & castor  
 oil have been found of use. Moderately stimulating  
 Glysters after the feces have been removed by gentle purges  
 are of use, salt is mixed with them with advantage  
 an infusion of tobacco & smoke injected has been found  
 Warm bathing has been found of great advantage  
 Opium is necessary throughout the disease.

Blister applied to the Nigs have been used with great success.

## Prophylaxis patients ought to avoid port, real, brandy

& coffee should be forbidden our patients. Gentle laxatives  
 Hemme too. exercise, cold bath, Opium in ʒi clost has been useful



30 Cholera - in children.

This disease appears in warm climates in July and August. It is supposed to arise from an excess in summer fruit. This disease is much more dangerous in old than young subjects.

The summer diseases are the Cholera in July & August Febris remittens biliosa in Septem<sup>r</sup> which continues six weeks sometimes eight, then in October the inflammatory Fevers.

Cure. The contents of the stomach should be first discharged by warm water or chicken broth we must have immediate recourse to laudanum which must be our chief dependence. Next diluents, hvent teas, toast & water, Mint tea, Cham<sup>e</sup> tea, rice water particularly. Application of warm breack applied to the umbilicus is of great service. To mitigate the spasms of the extremities rubbing them with warm Sp<sup>u</sup> is efficacious. Caton's toasted like coffee drunk grounds & all has been efficacious.



Cure Evacuate the bile by Ipecacuan<sup>a</sup> & Plant. Emet.

Gentle laxatives. Opium — Demulcents as the white Decoction  
Glysters of Tamarind Tree or mutton broth with A. Laud.  
Starch dissolved in water — Cordial & Tonic medicines  
as the decoction of Peppark with nutmeg — indulging  
children sometimes in their desires of stimulating  
stimulant has cured them.

Purifications are. daily use of cold bath of  
strong old wine — a moderate use of rectified  
removing children into the country before the  
time in which this disease occurs.

## Diarrhea in Children.

all ages are subject to this disease tho it more  
frequently happens from the age of 36. to 40.  
it is often of long duration sometimes 2, 3, 6  
months. Instances are recorded of its lasting  
15 years. This is supposed to be of the Atrophic  
kind, it often follows Dysentery.

Cure Rubent. & Vomits of Ipecacuan<sup>a</sup>.



32. repeated every week & Astringents as infusions  
of oak bark, tormentil root, Portwine: Bitters  
stimulants as turpentine pills, decoction of Guaiac.  
Decuents a chamomile tea & Malloes tea, Rice water  
mint tea & Blisters applied to the wrists are very  
serviceable tho they do not always succeed.  
They may be repeated, upon the former being dried.  
The diet must be regulated according to the  
appearance of the stools. If black regulable  
aliment and Summer fruit will be proper.  
There are proofs that animal acrimony prevails.  
Exercise is of great consequence, & Herule is much  
fact, an obstinate Diarrhoea has been cured by an  
inflammatory diathesis, There has been an  
instance of a lady with child, who being  
troubled with a Diarrhoea, was seized with a  
Pleurisy, she was treated as for a pleurisy and  
was surprised to find that her lax had left her.  
As the Pleurisy is attended with increased tone  
of the arterial system. It is supposed to have  
cured the disease by imparting tone to the alimentary canal.



Diavells see Cullen.

This disease is connected with debility and rickety habits. It yields to Tonic medicines and the cold bath Dr Meade has treated of it largely. common salt taken every morning is said to have cured it.

<sup>t</sup>  
Hysteria see Cullen

This disease may be distinguished from Hypochondria 1<sup>st</sup> by its affecting more women than men.

2<sup>d</sup> affecting single women more than married.

3<sup>d</sup> the Mulier Hystericus is Tachycardiac.

4<sup>th</sup> This is a disease of warm climates seldom of cold

Hysteria has been confounded with Epilepsy.

Its proximate cause is the same as that of Epilepsy viz. Otiosity — Cure the same as Epilepsy.

Hydrophobia see Cullen

This disease commonly, tho not always depends from the bite of mad animal. The common time

of its appearance after the bite is supposed to be

within 40 days but sometimes 3 months. I am disposed to follow the same principles here as in Tetanus.



24. *Quidam* *met* *the* *disease* *is* *occasioned* *by* *a* *sedentary* *cause,* *Does* *it* *not* *depend* *on* *debility?* *A* *Fact* *related* *by* *Boerhaave* *induces* *me* *to* *believe* *that* *it* *does.* *Two* *persons* *were* *bitten* *by* *the* *same* *dog.* *One* *of* *whom* *died* *of* *the* *disease.* *It* *was* *remarked* *that* *the* *wound* *of* *the* *person* *who* *died* *was* *healed* *before* *he* *was* *seized* *with* *Hydrophobia,* *while* *that* *of* *the* *person* *who* *recovered* *remained* *open* *&* *discharged* *considerably.* *Here* *the* *wound* *must* *have* *been* *accompanied* *with* *a* *great* *degree* *of* *inflammation* *I* *may* *not* *this* *inflammation* *have* *given* *such* *a* *tone* *to* *the* *system* *as* *to* *counteract* *the* *relative* *powers* *of* *the* *poison.* *Another* *fact.* *D<sup>r</sup> Mathias* *says* *that* *a* *mad* *dog* *was* *bitten* *by* *a* *visper,* *which* *produced* *a* *swelling* *&* *the* *dog* *was* *cured.* *The* *wound* *ought* *to* *be* *dilated* *&* *irritated.* *Warm* *cold* *bath,* *Exercise* *ought* *to* *be* *used* *in* *order* *to* *excite* *the* *greatest* *tone* *possible.*

*Order.* *Consider* *the* *judgements* *injured* *with* *pyrexia* *or* *leoma.* *The* *mind* *acts* *upon* *the* *body,* *&* *the* *body* *upon* *the* *mind.* *It* *consists* *of* *will,* *understanding,* *moral* *faculty,* *&* *conscience.*



*METHOD see Gullen.*

Facility is born with us, or acquired by old age or accidental causes.

A certain consistence of the brain is necessary to right understanding. Those of children are soft, brains of madmen commonly too firm. Dr. Stork employed Egyptian wood in amputations with evident advantage. Bore. Tonics, exercise, cold bath, cold air bid fair to be of service in this disease.

Facts. Dr. Priestly had a child who was an idiot at 6, or 5, years of age, it fell from a window & gained the use of its reason. Its skull was not fractured but much contused. Dr. Morro had a child in the same situation who recovered by being burnt in the foot. The exercising the faculties is the best method of preserving them. As thus we find some possessed of them to a very advanced old age.

The memory is capable of being improved. Toeffel This some Physicians recommend the study of Physic other Metaphysics. There is nothing more capable of improvement by exercise than memory —







37  
D. Dulcet recommends pukes when the  
disease occurs in Summer or Autumn for it then  
generally appears with bilious symptoms. It is  
hereditary depending on a certain conformation  
of the brain, & occurs at different periods of life  
often requiring occasion causes to produce it.  
we ought to have particular regard to the pulse  
If the Tonic prevails we must attempt the cure  
first by bleeding thus we diminish arterial  
tension & of course the nervous is also taken off.  
Purgings. Blistering, warm bath. cold water  
applied to head in such a manner as to produce sedative  
effects. violent labour all of which have been found  
of use. Opium after evacuations is of the utmost  
consequence.

Tonic Species a different mode of practice is  
necessary here. The most powerfully exciting remedies  
generally do but little service. Blisters, stimulants,  
vomiting, exercise, prove most beneficial —



38 Com Helmont says that melancholy which  
the same as Ottonic Madnys used to be cured by  
throwing the patient into water & keeping him  
there till almost drowned.

Com Levieten tells us that madnys is sometimes  
cured by Teur coming on. An inflammatory  
Angina has cured madnys as also an abscess  
in the Migh. Issues, Scatons incouraging abscesses  
& the more frequent applications of blisters is  
likely would prove useful. In the Tonic species some  
severity may be necessary, but in the Ottonic more  
gentle means are to be used.

*Oneirodymia.* The imagination revolts & throws  
visions in sleep. see Cullen.

Troublesome Dreams, Night mares, & walking in  
the sleep come under this head. In profound sleep  
the thinking powers of the soul are entirely  
suspended; in this situation therefore there is no  
dreaming. In those who walk, it is supposed that  
that



39  
that part of the brain which goes to the muscles  
is not collapsed. Hence the propensity of recommending  
Exercise which brings on sound sleep. Avoiding sudden  
surprises. Guarded to suppress the want of the usual  
stimulus <sup>will</sup> produce the same effect. An opiate may  
sometimes be necessary. 'Tis supposed that all  
those who go to bed well at night & are found  
dead in the morning die of Incubus—



## Cachexia in Cullen.

**Marcores** a wasting of the whole body—  
**Talus** Lemps; **Asthenia** & **Pectic** Tonus in Cullen  
 Children are more subject to this disease than men.  
 Ulcers in the Kidneys, Stomach &c are frequent causes of the  
 disease also scrophula & poison produce it. The poison  
 is often generated from the use of Copper vessels—  
 Cure Tonics, as bark, steel, cold Bath, Exercise &c

**Strophia** Lemps **Asthenia** without **Pectic** Tonus  
 When this disease does exist (which is doubted) the cure is  
 the same as above. But in chronic diseases would be a  
 valuable <sup>medicine</sup> if used in large quantities. Administered in powder  
 to the q<sup>ty</sup> of ℥i would prove very beneficial.

**Intumescencia** a troublesome swelling  
 on the whole or a great part of the body

**Adiposo**  
**Polysarcia** a troublesome swelling of the body from fat  
 That under certain circumstances is a disease. Those  
 who become fat before their 40<sup>th</sup> year are not usually long  
 lived.



41.  
After this period when the venous Reshore takes place it  
is sign of long life.

Causes of Fatness when it is a disease are Tense Intem-  
perance, intense study, and asceticary life, all these  
all these produce it which proves it to be a disease.

It also follows the cessation of certain evacuations, and  
the cessation of the stimulus of thinking.

Many remedies are tried none is to be depended upon  
but exercise.

## *Statuoso*

*Pneumatoso* Stems elastic swelling of the body crackling  
under the hand. see Cullen.

Whenever this disease occurs Exercise, Friction & cold bath  
are the only remedies to be depended upon.

*Tympanites* Stems elastic swelling of the abdomen  
costiveness, and constipation of the bowels. see Cullen.  
Cure. as above.

*Thysometra* see Cullen.

A swelling of the womb from wind

Cure. Tonics as Frank Sul &c



*Anasarca* An inelastic swelling of the whole or part of the body. see Cullen.

*Cure.* Purges of Jalap which are supposed to be the most effectual. Hydragogue purges; as *Scammony* & *Gamboge* Comits in *Anasarca* & *Ascites* are very powerful remedies. Comits & purges together. A large quantity of Tart. Emib. taken thro' mistake, wrought a person in a dropy very violently with weags & cured him. Diuretics as alkaline & mucrace salts, Nitre particularly is depressed in a time. From a table spoon full to a wine glass taken three times a day. Diaphoretics, Scarifications, Mercury Tonics, Aromatics, Phlisters & Symplicents have been found of use. *Ascites* Dr. W. Hergill recommends to leech as soon as possible, before the Symplicents have lost their tone.

*Hydrothorax* see Cullen. Symptoms see Dehaen. Oedematous swellings in the legs usually accompanying this disease.

*Cure.*



*Hydrorachitis* see Cullen.

*Spina bifida*. Caustic is said to have cured it.

*Hydrometra* see Cullen.

A dropping of the womb has been cured by mercury.  
 Steel dust in the quantity of  $\text{ʒij}$  to a dose is said to have cured it.

*Hydrocele* see Cullen.

There are two methods of cure viz. Caustic &  
 Needle. Most people prefer the caustic. The  
 inflammation excited by its action cures the disease.

*Rachitis Solida*.  
*Rachitis* see Cullen.

We have very little of this disease in this country  
 low diet contributes to deprive the bones of that  
 matter which is necessary to make them dense.

People think that putting children upon their feet  
 too soon disposes them to Rickets. This is the reverse.

Remedies are Steel, Mark, Frictions, Cold bath &  
 generous diet. A radical cure is to rub the spine  
 & whole body with Fish oil.



Lib. Impetigens in Cutis.  
Scrophula in Cutis.

Negros seem to be more affected with this disease than white people. A predisposition to this disease is hereditary, as in the Gout; but it is not congenital & may be acquired. Dr. White's chief dependance (who had experience of 1200 cases) was on Potash & small doses of Merc. C. Sub 1/5 or 1/6 of gr<sup>n</sup> at a time. The tumors most frequently appear in the neck and throat. Caution is necessary in discussing them as they very often fall upon the lungs and thereby bring on a consumption.

Syphilis in Cutis.

Dr. Hunter's Treatise on this disease is a valuable one. A fresh infection has been known to cure a Gleet. An infection of port wine will generally cure it. It may be taken off with them by coition.



45.  
Hypochondriacal Lulls. is of all others the  
most troublesome & distressing to which human nature  
is subject. It is called the Noddy Pox. If the disease  
does not appear within three months after coition  
in the usual place we may assure the patient there  
is no infection. It first appears in Bumps, Chancres,  
Buboes, or sores upon the scrotum.

Cure, see Hunters Treatise. Opium is not a radical cure  
for this disorder. The Quick Silver pill is to be refused  
to any other presentation of Mercury, as persons  
under the use of it are not liable to catch cold nor  
prevented from pursuing their business.

Scorbutus consult Lind or Ferrius. That the  
Glands are vitiated is certain Dr Wilson's theory  
is that the solid parts are the seat of this disease. Scurvy  
promissions are said to produce scurvy. His thought  
not to be a putrid disease, because the blood is Anti-  
septic Dr Boerhaave takes notice of a dimness of sight  
which takes place in this disease -



46. Cure. This must consist in removal of all the  
remote causes & cure the disease also. Lime, orange  
or Lemon juice are the best applications for the  
sores that occur. Poultices applied should be sprinkled  
with Lemon juice &c.

Elephantiasis *Sepra*. Tremulosa & Trichoma  
see Cullen.

These diseases seldom occur at present. Trichoma  
the formerly very common in Poland is at present  
little known. Tremulosa or the yaws has been cured  
by Merc. b. sub. Gum Guaiac given in large quantities

Sterus see Cullen.

Jaundice from Calculi is common is common. These  
calculi are composed of indurated bile, therefore inprop-  
erly called calculi. They are inflammable. Boerhaave  
recommends drinking warm water in large quantities  
as a relaxant.

Cure. should begin by an Emetic; the bowels should  
be kept open; Aloes are most commonly used & said to



description & aversion to all kinds of motion occur. This  
should be remedied by blister. Where these remedies  
prove unsuccessful Calomel is serviceable. Mineral  
acids on account of their astringency are good.

Icterus Gravidarum comes on during pregnancy & is cured  
by delivery.

Icterus Infantum is cured by Rhubarb

Locales. in lumen

Dysosthesia in lumen.

Gen. Catigo. in lumen

An instance of which occurs in Cataract. Mer. & Sul.  
is said to be service in incipient cataract.

Leucthing is generally the only effectual means  
it is commonly unsuccessful. Another instance is  
from opacity of the cornea a defect of aqueous humor  
also sometimes from gutta serena, which is a  
disease of the retina arising from compression.  
when this disease arises from compression blistering  
& purging are to be used



110 *Amaturosis, Dyspnea Pseudoplethys. in Cullen*  
*in Authors* —

*Dyssecora Paracusis in Cullen.*

Sir J. Pringle says that Dyspnea is incurable only when it arises from indurated wax, which may be extracted by instruments. Mennewater injected for 2 or 3 months is said to be the best when

*Idiosyncrasy*. The smelling diminished or abolished.

It arises from a defect of mucus or insensibility of the olfactory Nerves. This disease has been cured by strong Escharics. —

*Igheusia* the sense of taste diminished or abolished.

This arises from the same cause as the former and is cured by Stimulants. Taste is compared to Music & has its accordant & discordant tones if may so say. When two substances that accord, are combined they produce an agreeable sensation, as the concord in Music. When the discordant are conjoined; as Fish & Flesh it occasions a disagreeable & uneasy sensation, &c. manifestly.



merely a disagreeable taste, Facts as the discordant  
jarring sounds of music —

**Anesthesia** the sense of feeling abolished or  
diminished. On this & the former disease see authors.

Or 2<sup>d</sup>. **Dysorexia** an inordinate or deficient  
appetite.

**Bulimia**. An appetite for food in greater quantities  
than can be digested. — An excessive appetite is often  
a disease, 'Tis difficult to fix the cause of this disease  
till we are acquainted with the cause of hunger.

Aliment serves two purposes 1<sup>st</sup> to nourish and  
supply waste 2<sup>d</sup> to act as a stimulus ~~as a stimulus~~  
and give tone to the system. Habit regulates  
this stimulus, It is by habit this disease is  
acquired, so by inducing a contrary habit by  
degrees, this disease is cured.

**Polydipsia**. An unusual appetite for drink.

This disease is often artificial. Tho' it is frequently  
symptomatic of other diseases. The Indians who



50. who live more agreeably to nature than any  
other people never drink before noon, & then but little.  
The warmest weather seldom occasions drinking before  
2 o'clock. Drink is either stimulant or sedative in  
both cases it must be manifestly injurious: for the  
secondary operations of stimulants is always sedative.  
A dramful of common salt has cured it.

*Pica* A desire for things not used for food.

This disease occurs in Chlorosis, when an acid abounds.  
Nature directs them to eat chalk lime &c which  
destroys it. Children often show a great desire  
for salt meat, which is thought to be strange;  
but as in them an acid abounds the salt meat  
is one of the best medicines: as by giving tone  
to the stomach it avoids acidity.

*Dyspepsia & Symphomania* in children  
They occur from physical causes, as Indigestion, fulness of  
diet &c. The best antidote is morning Labour.

*Cannabis* has been said to be an antidote. The  
Monks take it to subdue their appetites. It acts as a Sedative.



This disease is either simple or complicated with other diseases. It was first remarked among the Swiss. New England men are sometimes also very much affected with home sickness. People who arrive here from Scotland are apt to be affected with Intermittents, It is amazing with what force this disease blends itself with it, so much as to make them perfectly miserable if they cannot return which is the best remedy.

### *Appetitus, Deficientes.*

*Anorexia*. a deficient appetite for Food. This is a symptom of Dyspepsia.

*Adipsia* a deficient appetite for Drink. It is most frequently a symptom of a disease.

*Maurodisia* a want of Lust or Impotence of Venery.

Cure. Cold bath and Electricity.



*Asphonia*, a total suppression of voice without  
 Coma or Syncope. 'Tis sometimes occasioned by a  
 tumor in the Trachea. Salivation has effected a  
 complete cure.

*Mutitas* an impotence in articulating words.  
 When this is congenial it is not incurable.  
 Many persons born dumb have been taught  
 to speak by M<sup>r</sup>. Prynwood he concluded that  
 a child must be necessarily ~~born~~ dumb who was  
 born deaf, Thence concluded that the organs of  
 speech might not be injured.

*Paraphonia* a deformed sound of the voice.  
 The voice changes at the least of age. Hoarseness  
 generally arises from a defect of mucus in the Trachea;  
 in this Demulcents as Siquorice &c are proper.  
 When it arises from relaxation, Acids will relieve



53.  
Stellismus A defect in the articulation of words. Cullen.

Stuttering arises from a convulsive motion of the tongue. Passion, Fright, haste &c produce this where it is not habitual. When it is ringing will relieve it or speaking very deliberately.

Strabismus. The optic axis of the eye not converging  
squinting arises originally from weakness sometimes  
from disease frequently from carelessness or accident.  
Cure. A pair of Spectacles of paste board worn for a  
length of time has been found to cure it.

Contractura in Cullen.

Warm bath relieves this disease when it arises  
from the enlargement of the capsular ligament.  
Deep Excisions made by caustic proportioned to the  
enlargement of the joint, & kept running will be service.

Dysphagia in Cullen —

Or 4<sup>th</sup> Stenoses.

Profusio. A flux of blood.



54 Malignus from Jaundice. Many persons from  
a slight cut or the drawing of a tooth are in the most  
danger of their lives, Sometimes actually die, Nothing  
but compression till the artery has united with relief  
this disease. A discharge of this kind from the Nipple  
has been cured by applying a rag wet with  
Port wine to the part affected.

*Epidrosis* A put natural Evacuation of sweat.  
When this disease is uncurable the cure is to be attempted  
by a flannel shirt, Menth & Elixir of Vitriol. When it  
is partial washing the part with port wine.

*Epiphora*. A Flux of Lacrymal humors  
*Fistula Lacrymalis* has been cured by Mercurial  
frictions & Excretion —

*Rhyalism* A Flux of Saliva —  
This is cured by exciting evacuations elsewhere. That  
species occasioned by Mercury is certainly cured by  
purgings. Sulphur is esteemed the most proper purge. Sucking  
Limes or Lemmons when the mouth is not sore removes the disease.



**ONURISIS** an involuntary flux of urine from  
the bladder & without pain.

That species arising from want of tone in the <sup>ureter</sup> ~~ureter~~  
~~ureter~~ is best relieved by a blister applied to the perineum.

This gives tone to the perineum which is communicated  
to the bladder & thus cures the disease. Balsams Canthar.  
&c are frequently given also.

That arising in the last  
months of pregnancy is remedied by bleeding & purging  
taking off as much as possible the compression & irrita-  
tion. After the purge an Anodyne may be given.

Weak & Tonics are of service —

**Gonorrhoea** in children.

This disease seldom appears after 12 days from 3.  
to 4. is the usual time.

Gonorrhoea pura & venerea occurs from injuries  
bruise, strain, &c —

Impura may be communicated otherwise than  
by having connection with impure women.



56 Cure of this species has been attempted. The  
use of caustic Alkali which may be safe & successful  
when the first symptoms of the disease appear; it  
must be used however as soon as the infection is  
received; or not at all, after the symptoms have  
proceeded, it will then be injurious. It must be used  
by way of injection very much diluted when  
it will be as effectual as Doan's in Intermitents.

(2. Dry mercurial injections, of which I have always  
found the following one the best.

R<sup>x</sup>. Ung.<sup>t</sup>. Merc. ℥i. Nuculag. Gum Arab. ℥ij.  
Vitell. Avi No. 1. Aq. Font. ℥ iij. m. —

For this injection, the ointment should be made  
without Turpentine. Sulfur, Calomel or Mer. C.  
sub. dissolved in water are also used. —

(3. Lenient Purges are sometimes of consequence  
they are only useful in keeping down inflammation.  
When the discharge is thick & whitish, & the inflam-  
-mation gone off you may have recourse to astringents.



57.  
Astringents & Stimul. as Balsam Copait. & Pel.  
Chalyb. Injections of Sac. Saturn. are sometimes  
used, but it is apt to induce an inflammation of  
the neck of the bladder. Where ulceration is suspec-  
ted in the urethra Calome may be injected.

Gleet is in the penis, what a Coryza is in the  
nose. Ure. em. increased secretion of mucus. When it  
subsists a long time, ulcers occur which are troublesome  
& are to be cured by mercury. Where it arises from  
Relaxation. Astringent injections are to be used.  
The most frequent one is round claret, or equal parts  
of Port wine & sweet. This is more efficacious and also  
safer than any other. When the gleet continues  
six months there is no danger of infection —

**Dormientum** is a very troublesome  
and obstinate disease. When leech, steel, wine  
and cold bath have failed, it may be perfectly  
cured by salivation. Lying upon the back is  
unfriendly to this disease —



58. Or 5. Epischesis a suspension of the  
evacuations

Obstipatio in Cullen.

This is a common symptom in Hypochondriasis  
and Dyspepsia. Scurvy people, hence more  
women than men are troubled with it from not  
being able to deny the calls of nature. The dinner  
of a stated time, frequently referring to the usual  
place at that time would prevent the ill effects  
attending this disease. Vegetables are more as-  
suant than animal food. Mullen's pill is used  
in this case: but dangerous on account of its narcotic  
properties: Apoplexy attends the repeated use of it—  
Blue root chewed in the morning prevents it—  
Glysters are injurious as they relax the intestines—

Ischuria, a total suspension of urine.

Owing to worms sometimes in the bladder, ureters,  
& kidneys they have been discharged without pain.  
That which arises from Gravel, Uearts, Caruncles &c  
is



is of all the most difficult to cure. Triscidew 59.  
is said to be the vinculum which binds the particles  
of stone together. Alkalies is known to be a solvent.  
℞. Alk. salt dissolved in Pyrament water or Chemich  
℥ss ℞. ʒ. ʒ. A tea cup full taken twice a day is an  
excellent remedy.

Uva Ursi acts in this case as a tonic & blisters  
the back succeeds as well. A biscuit or crust of bread  
taken every morning has proved serviceable. In the  
relinquish there is always a Septic tendency. after  
stagnation it is supposed to possess dissolving quali-  
ties not present in it before.

**Dysuria** a most painful & in some cases impeded  
emission of urine.

It occurs from Gonorrhoea, or Cystitis taken or  
applied.

Cure. demulcent drinks as Flax seed, Maren or  
Marely Tea, with Qu. Acid. it occurs from sperm  
compression. Mass & Opium. Relaxatives are  
to be depended upon. Catarrhus Vesicae is.



60. is easily known from the venereal affection  
1<sup>st</sup> by the cause not preceding, 2<sup>d</sup> being not  
accompanied with inflammation 3. The matter  
being remarkably viscid, never green or tinged  
with blood.

Cure, Tonics, Astringents, Injections, Balsams &c  
This disease is sometimes a symptom of Gout.

## Dyspermatismus in Cullen

## Menorrhoea in Cullen

This disease arises either from emission or suppression.  
When there is Fever it must be treated as the primary  
disease. Blood letting is seldom necessary.

Emmenagogues Probably no medicine acts directly  
on the uterus. Many act indirectly by strengthening the  
whole system. That is proved except where affections of the  
Lungs occur in doses of from ℥i. to ℥ss. Mercury is used as  
a general stimulant. — The Chalybeate powder is to be



to be given in powder, & the salt of steel in pills - in three  
large doses R<sup>d</sup> of them will generally be sufficient.  
Tonics in the interval & Anodynes during the discha-  
rge will be useful.

In all chronic diseases of females, we should suspect con-  
struction of the menses.

About the time that menstruation ceases Menorrhagia,  
Stillicidium, Flatulency, Pneumonic Complaints, Cancers  
of the womb, or Breast, Piles &c. sometimes occur.

Then occasional bleeding & keeping the bowels gently  
open with Tarter Sulphur will be necessary -

Or Tumors.

As in enlargement of a part without Inflammation  
Aneurisma Varix Ecchymoma. see letters.

In Bleeding. No blood will often insinuate itself between  
the skin & muscles. It appears black sometimes alarming  
nothing is necessary to be done the blood is absorbed  
in a few days.



62. *Schirrhus* see *Cancer*.

It should by all means be extirpated as it generally  
tends to a cancer. The Knife is the best mode. Mercurial  
ointment will sometimes discuss these tumors.

It is better remove it before suppuration.

*Cancer* see *Cancer*. *see also Cancer*

Cancer on the breast or neck is attended with most danger

In ulcerated cancers caustic is the best remedy.

There are various caustics as Oil Vit. Lean. Lun. Lap. Infer.

*Serum Alb.* is thought to be preferable to any. The strength  
of the application can be better regulated. It acts by  
inducing inflammation which throws off the morbid  
part. - About 15 or 20. grs. to 3 i. ag. sent. & a  
piece of linen dist in this and applied to the part  
once a day is found to be the most successful manner.

*Boibo.* a suppurating tumor of a congested gland.

Caustic is the best manner of opening it.



63.

*Lupia* a movable soft swelling under the skin without pain.  
As soon as this disease appears a caustic should be  
immediately applied to the part, which seldom fails  
of effecting a cure.

*Hydalis* vesicles of the skin, filled with a watery <sup>humor</sup>  
This may be caused by the long continued use of *emula*  
*cathartics*; as sulphur & laudanum salts &c. The most certain  
remedy is Calomel & wheat Flour  $\frac{1}{4}$  parts of calomel  
&  $\frac{3}{4}$  Flour may be begun with & gradually increased  
till we arrive at equal parts. N. B. A Quack Remedy.

*Hydarthrus* in children.

While swelling chiefly affects the knee. A perpetual  
blister or caustic plaster continued for 3 months is  
seldom known to fail.

It is a distressing application.



*Ocostosis.* A hard tumor adhering to the bone  
Consult Well.

Ord *Ectopic* in Cutis.  
Treatment. Well Pills & —

Ord. *Dysphes* in Cutis

In all cases where joints are injured by gun shot  
wounds amputation. In endeavoring to save the  
limb the patient is lost. The bones become carious  
at length an Pectic Fever closes the scene.

In wet cases there is generally a great deal of  
contusion. A tendency to gonorrhea particularly in  
Summer which renders the taking of Boonk indis-  
pensably necessary —



Ulcus. in Cutis.

65.

They appear chiefly in the legs. There is an intimate connection between sore legs and intertrigo.

Cure. by diet avoiding the use of spirit by Menstru by destroying fungous flesh by Escharotics; by bracing the part affected with a laced stocking. Termers Cure.

The vegetable milk, Sarsaparilla, Mercury acts as unusual stimulant by revulsion. The carrot poultice; wort liquor all have been used with evident advantage.

Herpes & Tinea in Cutis -

To the part should apply the ointment or that of blue Vit.

If this fail sprinkle the powder of Calom. & Flour on twice a day.

Should this fail a solution of white Arsenic is said to be an important remedy

Prova. Fractura Caries in Cutis.

Itch &c. in Cutis



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# Contents

Practice of Physic; & Disease;	
Causes; & Symptom;	3
Diagnostic Signs; Prognostic	4
Divided Diseases divided	5
Indications of Cure; <sup>in Diseases</sup> Remedies	6
The Powers of Nature in the Cure of Diseases	6
The Pulse directions concerning <del>it</del> feeling it	9
Fetres, their Causes considered,	11
Marsh Effluvia; Contagions	12
Prognosis, of critical Days	17
Prognosis of the Signs of Death or Recovery	18
Prognosis afforded by the Pulse	21
Prognosis of Intellects	22
Indications of cure in Fevers	23
Intermittents,	23
Continued Fevers, with a slight Cough or Pain	29
The Drinks proper in Fevers 31. The Laxatives 32. General Observations on arterial Tension 33.	



Typhus Mitior Gravior and Scleroder	
or the Yellow Fever of the West Indies	114
Reasons why Madeira Wine is best	119
Antiseptia	116
The Convalescent State	117

Synochus. Hectica Phlegmasia	49
Phlogosis or Inflammation or Swelling on any part of the Body or a Sore Breast	50
Paronychia or Felson from Bruise or Cold	52
Anthrax appears on the Back like a Honey Comb	53
Burns, Chilblains	53
Gangrene	54
Ophthalmia or sore Eyes	54
Phrenitis, an Inflammation of the Brain that is curable, & causeth Madness	56
Cynanche or sore Throat	57
Maligna idem, attend. with watery Eyes, drawling <sup>voice</sup>	58
Tracheitis by some called <sup>q</sup> . Hives accompanied with a sore throat and barking Cough	59



	69
<i>Pharyngea</i> agrees in many respects <i>Tonsillaris</i>	63
<i>Parotidea</i> , or the <i>Mumps</i> .....	63
<i>Pneumonia</i> .....	64
<i>Peripneumonia</i> .....	64
<i>Pleuritis</i> or <i>Pleurisy</i> .....	65
<i>Gastritis</i> Symptoms are weakness in the Limbs <sup>or Golden Age</sup> <del>occasional</del> by Cold drinks or acid taken into the Stomach.....	70
<i>Enteritis</i> much the same as the foregoing.....	71
<i>Hepatitis</i> is more frequent than the former, the Pain sometimes extends across the <i>Hypochondrium</i> .....	72
<i>Nephritis</i> in this the Urine is red, and the Testicles are drawn up, a Vomiting and Cholic attend it.....	74
<i>Cystitis</i> .....	75
<i>Hysteritis</i> an inflammation of the womb brought on by <del>Hard</del> <sup>Difficult</sup> Labour.....	76
<i>Rheumatismus</i> .....	77
<i>Odontalgia</i> , or Tooth Ach.....	79
<i>Podagra</i> , or Gout.....	81
<i>Crurapropulsio</i> .....	88



Rubeola or Measles	91
Scarlatina Anginosa or Cynan- chica, a sore throat with red shining Sipes.	92
Hæmorrhagia, a disease that attend <sup>old age</sup>	93
Particular Hæmorrhages.	
Epistaxis, a Spitting of <sup>nose</sup> Bleeding at	94
Hæmoptisis, a Spitting of Blood,	97
Phthisis Pulmonatis	99

## Vol. II

Hæmorrhoids, a Vomiting of Blood occasioned by Costiveness	1
Menorrhagia, Menstruation	11
Hæmorrhagia Uterina	11
Menorrhagia Aborta	16
Leucorrhœa very like a Gonorrhœa	16
Catarrhus	17
Dysentericæ	19
Comata Apoplexia, &c &c	12-16
Paralysis, Hemiplegica, Paraplegica	17
Venerata, from Poxes, arising from Ichnefs	17



Tremor.

71  
18

Syncope the motion of the Heart diminished. 19

Dyspepsia a Disease of the Stomach. 19

Nausea Marina. 21

Hypochondriasis. 21

Spasmi. 24

Tetanus. 25

Convulsio. 25

Chorea Raphania. 25

Epilepsia. 26

Palpitatio. 26

Asthma. 26

Dyspnea, the same as Asthma. 28

Pertussis. 28

Pyrexia like a symptom of Dyspepsia 29

Colica. 29

Nephylaxis. 29

Cholera, The Sickness of the Stomach } 30  
with a flux and Vomit

Diarrhea. 31



Hysteria	33
Hydrophobia	33
Imbecilia, Idiotism	35
Melancholia	36
Mania	36
Cnecrodynia, Troublesome Dreams, Night Mares, and Walking in the Sleep - }	38
Marcoria, Atrophica	40
Intumescencia, a troublesome Swelling	40
Polysarcia, from Fat	40
Matuloso	
Pneumatoso, a tense elastic swelling of the Body	41
Tympanites, a tense elastic swelling of the Abdomen	41
Physometra, a swelling of the womb from Wind	41
Aquoso	
Anasarca, an elastic swelling of the whole or part of <sup>Body</sup>	42
Hydrometra, a Dropsy of the Womb	43
Hydrocele	43
Solida	
Prachitis, or Pickets	43
Scrophula	44
Syphilis	44



Lues. or Nodde Pox ————— 73  
45

Scorbulus ————— 45

Elephantiasis Lepra or Yaws — 46

Icterus jaundice ————— 46

Dyssecoria Paracusis loss of hearing — 48

Anosmia Smelling diminished — 48

Agheusia the sense of Taste dimin<sup>d</sup> — 49

Anaesthesia the sense of feeling abolished — 49

Bulimia a great Appetite ————— 49

Polydipsia an unusual appetite for Drink — 50

Pica A desire for things not used for Food — 50

Stomachicums ————— 51

### Appetitus Deficientes

Anorexia a deficient appetite for Food — 51

Adipsia a suppressed appetite for Drink — 51

Anaptyrdia Impedency ————— 51

Phonia a total suppression of Voice — 52

Mutitas, Paraphonia a depraved sound — 52

Strabismus Squinting ————— 53



Contractura	53.
Profusio <u>Profusio</u>	53
Epidroasis, a profusional Evac. of sweat	54
Epiphora, a Flux of Lacrymal humors	54
Hyalismus, a Flux of Saliva	54
Enuresis a Flux of Urine	55
Gonorrhoea	55
Dormientium	57.
Or <u>Epischeses</u>	
<u>Suppression of the Evacuations</u>	
Obstipatio	58
Ischuria, a total suppression of Urine	58
Dysuria	59
Amenorrhoea, <u>Emenogogues</u>	60.
Or <u>Tumores</u>	
Schirrus, Cancer Bubo	62.



*Supia, Hydatis, Hydarthrus* 63.

53.

53

54

54

54

55

55

57

109

58

58

59

60

62

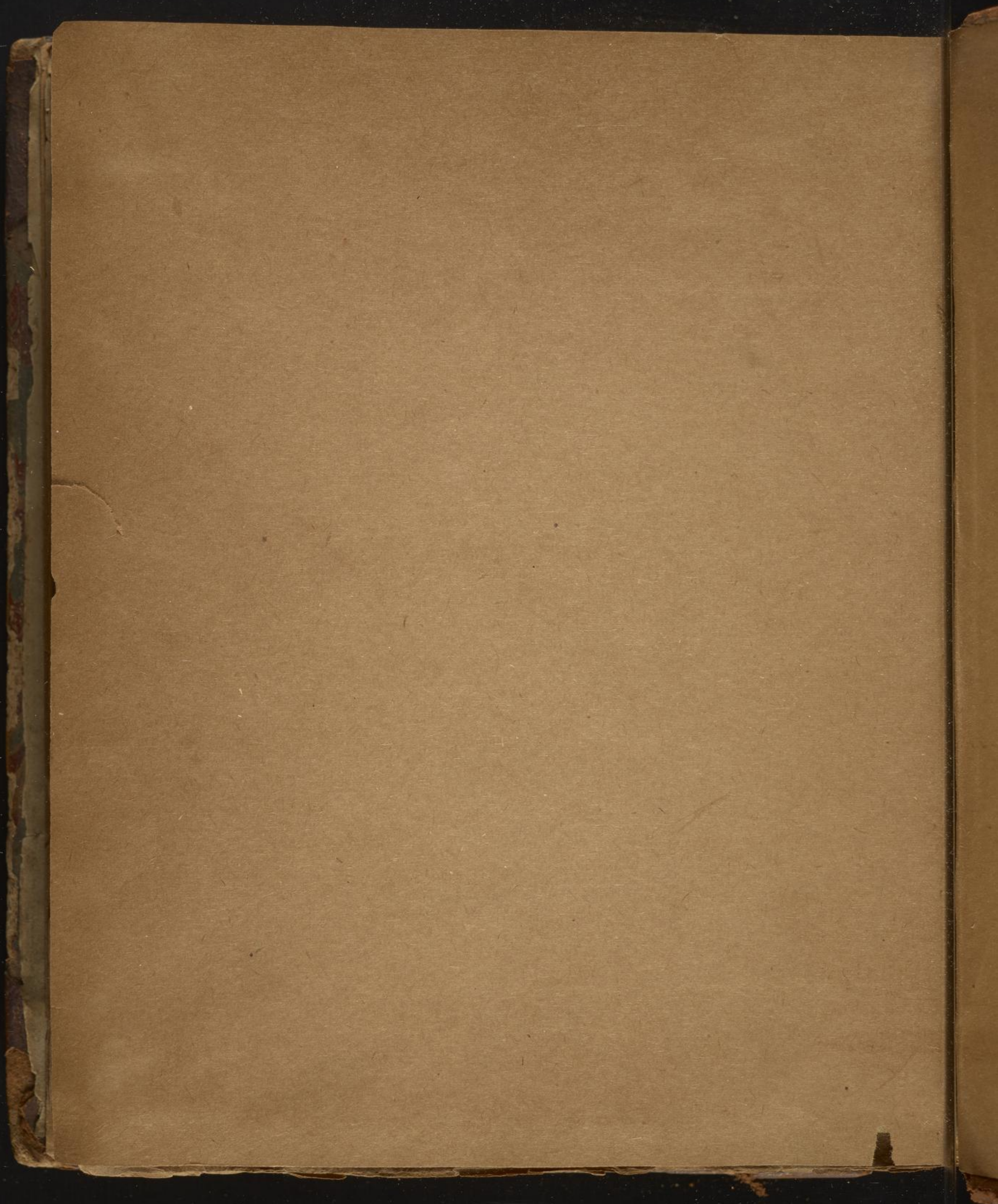


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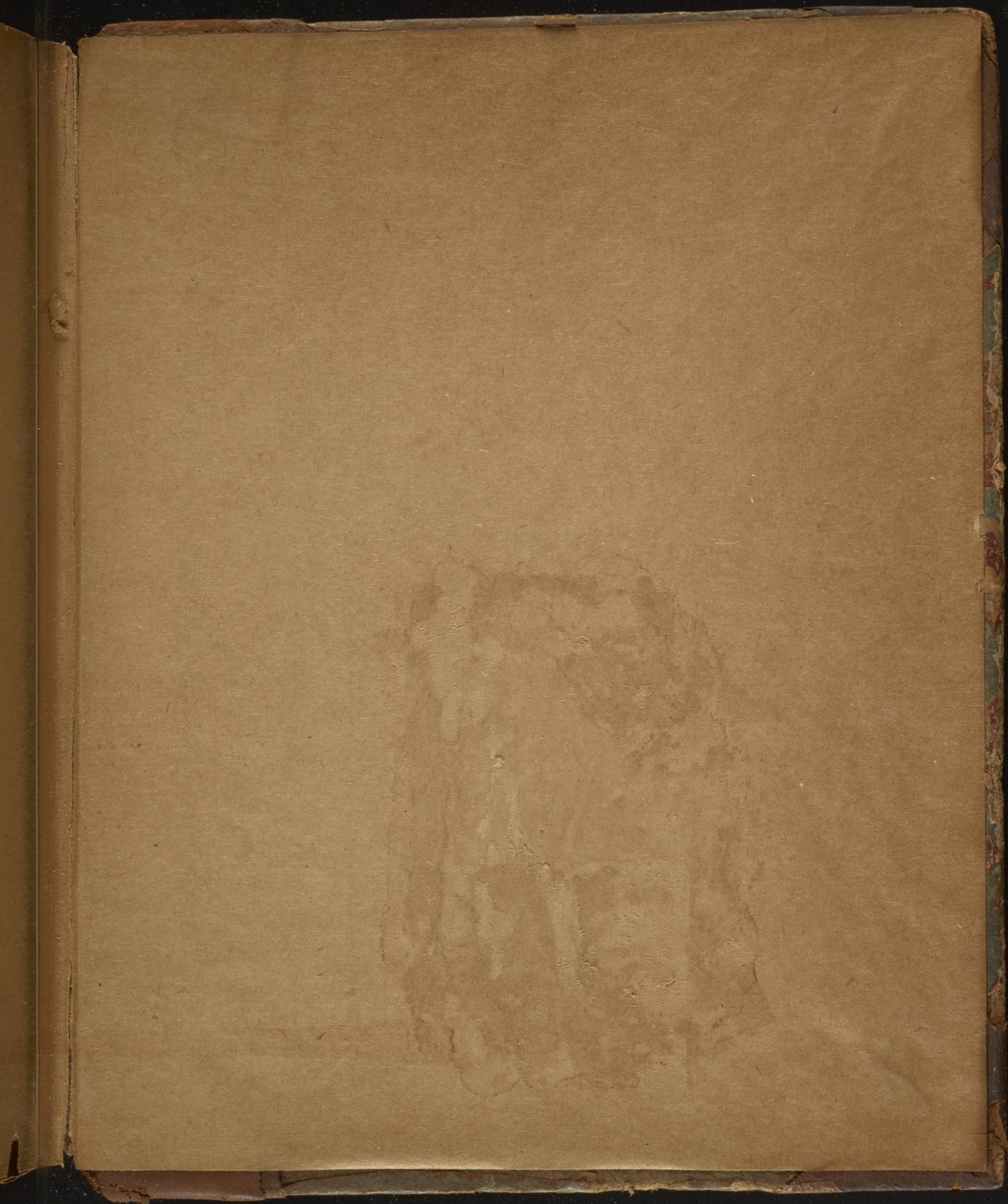
















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